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The Commonwealth of Massachusetts

# CONSOLIDATED REPORT

OF THE

# DEPARTMENT OF PUBLIC HEALTH

FOR THE

FISCAL YEARS 1950 THROUGH 1956

VOLUME I

The Commonwealth of Massachusetts

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July 1, 1956

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# The Commonwealth of Massachusetts

## CONSOLIDATED REPORT

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## REPORT OF THE PUBLIC HEALTH COUNCIL

### Personnel

On July 1, 1949, the Public Health Council was constituted as follows:

William H. Griffin, D.M.D., Boston
Gordon Hutchins, Concord
Paul J. Jakmauh, M.D., Milton
Francis H. Lally, M.D., Milford
Raymond L. Mutter, Holyoke
Charles F. Wilinsky, M.D., Brookline

It is with deep regret that we record the death on August 4, 1953, of Dr. Francis H. Lally, who served the Commonwealth faithfully as a member of the Public Health Council since 1924. At a meeting on August 25, 1953, the Council adopted the following resolution expressing the loss to the Department in Dr. Lally's death:

### *In Memoriam*

Whereas, God in His Infinite Wisdom has called from our midst to his eternal rest our good friend for many years and fellow member of the Public Health Council, Francis H. Lally, M.D., and

Whereas, his friends and associates feel a deep sense of personal loss in the death of one who did so much to help further the health and welfare of the people of the Commonwealth by his service on the Public Health Council for twenty-nine years, and

Whereas, in our many contacts with him we were privileged to have an insight into his qualities of tact, integrity, and devotion to high ideals, and

Whereas, he gave of himself and his time unselfishly and willingly in order that the people of this Commonwealth might benefit from his wisdom;

Therefore, Be It Resolved: That this expression of great loss be written on the records of the Department of Public Health in the minutes of August 25, 1953, and that a copy of this resolution as well as a message of deep sympathy be forwarded to his family.

Dr. Conrad Wesselhoeft of Boston was appointed in December, 1953, to fill Dr. Lally's unexpired term, and in May, 1954 Dr. Wesselhoeft was reappointed for a complete six-year term.

Dr. Griffin, Dr. Wilinsky, Mr. Mutter, and Dr. Jakmauh were reappointed for six-year terms in 1951, 1952, 1953, and 1955, respectively.

In May, 1950 Mr. Paul F. Flaherty of Boston was appointed as a member of the Public Health Council in place of Mr. Gordon Hutchins, whose term had expired. Professor Gordon M. Fair of Cambridge was appointed in May, 1956 in place of Mr. Flaherty, whose term expired.

Under General Laws, Chapter 17, Section 3, the Commissioner of Public Health is ex officio a member of the Public Health Council and serves as Chairman.

In February, 1956 Miss Florence L. Wall completed twenty years' service as Secretary to the Public Health Council. Miss Wall continues in her position, but in view of the distinction of having served in this capacity under four commissioners the Public Health Council at its meeting on February 14, 1956 gave suitable recognition to this service.

On June 30, 1956 the membership of the Public Health Council was as follows:

William H. Griffin, D.M.D., Boston, 1945–57
Charles F. Wilinsky, M.D., Brookline, 1946–58
Raymond L. Mutter, Holyoke, 1947–59
Conrad Wesselhoeft, M.D., Boston, 1953–60
Paul J. Jakmauh, M.D., Milton, 1949–61
Gordon M. Fair, B.S., Dr. Ing., Cambridge, 1956–62

## Meetings

Regular monthly meetings of the Public Health Council were held in accordance with General Laws, Chapter 17, Section 3, usually at the State House, Boston. Some meetings were held at the institutions under the jurisdiction of the Department. Such visits are planned in rotation, so that each institution is visited about once every three years. This practice allows the Council members to familiarize themselves with the individual programs of each hospital and to inspect the physical facilities for the care of the patients and for maintenance and housekeeping. During the period of this report, Council meetings were held at North Reading State Sanatorium in 1949 and 1952; at Lakeville State Sanatorium in 1950, 1952 and 1953; at Westfield State Sanatorium in 1950, 1952, and 1953; at Rutland State Sanatorium in 1952; at Pondville Hospital in 1951 and 1954; at Lemuel Shattuck Hospital in 1955; and at Massachusetts Hospital School in 1956. When visiting the institutions, the Council gave particular attention to preparations for civil defense, including facilities for storage of litters, auxiliary pumps, generators and other supplies, and emergency accommodations should an evacuation of patients and staff become necessary.

In addition to its regular monthly meetings, it was necessary for the Council to meet to hold public hearings, to meet jointly with the State Advisory Council on the Administration of the Hospital and Medical Facilities Survey and Construction Act, or to consider new activities and responsibilities added to the Department from time to time, usually by legislative act. A special meeting was held in March, 1953 to join with the Special Commission on the Structure of State Government in a public hearing to consider the recommendations of that Commission relative to the Department of Public Health.

Because of the desire of the Council members to become as familiar as possible with all public health activities in the Commonwealth, the Council continued the practice established several years ago of holding certain meetings each year in sections of the State away from Boston to consult with local health officials or to view public health installations of various kinds.

In July, 1949 conferences were held with the County Commissioners of Nantucket, who also constitute the Board of Selectmen and Board of Health. Matters of sanitation, a proposed regulation for pasteurized milk, and the conduct of immunization clinics were discussed. Inspections were made of the privately owned and municipally owned water supply systems and sewage disposal works. Five years later, in September, 1954, the Council again met at Nantucket with the Board, and discussed particularly the polio situation at Nantucket, programs for vaccination and inoculation of school children, sanitation, and food handling. With the Hospital Trustees and Superintendent the present buildings housing the Nantucket Cottage Hospital were inspected, and the site of the proposed hospital was viewed.

In Barnstable County in July, 1950 the County Health Officer met with the Public Health Council to discuss his local problems, and with him the Council viewed public health facilities, including sanitation and food handling at the National

Guard Encampment at Wellfleet, and the water supply of Provincetown. A meeting was held at the Cape Cod Hospital at Hyannis and on the following day at Barnstable County Sanatorium at Pocasset.

In August, 1950, in cooperation with the Division of Marine Fisheries, an inspection was made of the sewer outlets and sources of pollution along the north shore of Massachusetts. The Council met again in Gloucester in August, 1953 and inspected the site of the new Putnamville Reservoir of the Salem-Beverly water supply and the water filtration plant on Wenham Lake.

In Franklin, Berkshire, and northern Worcester Counties in June, 1951, inspections were made of the sanitary condition of the Westfield, Housatonic, and Millers rivers, the Pittsfield water supply, and the Lee sewage treatment works. Conferences were held with the Mayor of Pittsfield, the Commissioner of Public Works of Pittsfield, and officials of the Athol Hospital. An inspection was made of the new municipal incinerator at Pittsfield, one of the most effectively operated in this section of the country. The source of water supply for the town of Bernardston, a dug well, a most unusual source of town water supply, was visited.

In July, 1951 the Council met at the Woods Hole Oceanographic Institute, where members of the scientific staff explained their studies on shellfish and other forms of marine life; on Martha's Vineyard the Council inspected certain shores to observe the effects of certain tidal conditions, and held conferences with representatives of the Board of Selectmen.

At the invitation of Dr. Charles F. Wilinsky, a member of the Public Health Council and Executive Director of Beth Israel Hospital, Boston, the Council held its March, 1951 meeting at that hospital. Under Dr. Wilinsky's guidance the Council visited various departments of the hospital, inspected the facilities for in-patient and out-patient care, and viewed the work being done at the new Yamins Research Memorial Laboratory for surgical research.

On September 28, 1955, at the invitation of Dr. Kenneth I. E. Macleod, Director, Nashoba Associated Boards of Health, the Council met in the towns of Ayer and Harvard in connection with the observance of the twenty-fifth anniversary of this association. Representatives of several of the sixteen towns included in the district attended the meetings. The general programs of the Associated Boards, special programs of the individual communities, and a general outline of the history of the Associated Boards of Health were discussed.

At the Lawrence Experiment Station in June, 1956 a meeting was held for a two-fold purpose: to hold a hearing on the revocation of a hospital license, and to provide an opportunity for the Council to inspect various aspects of the work done by the Department at the Lawrence Experiment Station on the chemical and bacteriological analyses of water, tests on sewage and industrial wastes, air pollution, radioactivity, etc.

Annually, in June, meetings of the Public Health Council were held at Amherst coincidentally with the Amherst Health Conference.

The Committee on Environmental Sanitation, composed of Dr. Jakmauh, Chairman, Mr. Mutter, and the Commissioner, has met regularly prior to the regular Council meetings to study matters of sanitary significance and to prepare recommendations on them for presentation to the full meeting of the Council.

## General Duties

The regular duties imposed upon the Council by General Laws, Chapter 111, Section 3, and other statutes have been carried out. These include the following: the approval and licensing of hospitals, hospital blood banks, convalescent and nursing homes, boarding homes for the aged, public medical institutions, city and town infirmaries, dispensaries, and dental clinics which comply with the Department's minimum standards; the certification of laboratories which have taken part in the annual evaluations carried on by the Department's Institute of Laboratories and have demonstrated their ability to perform satisfactorily the tests listed; approval of changes in health district boundaries; approval of the creation of new divisions or changes in title of existing divisions within the Department; approval of

professional personnel in the Department and at State and county sanatoria; approval of contracts between medical milk commissions and dairies for the production and sale of certified milk; approval of food regulations of local communities which submit them for approval under General Laws, Chapter 94, Section 146; advice to cities and towns and official agencies on sanitary problems of water supply, sewage disposal, nuisances and offensive trades, and prevention of pollution of inland and tidal waters; approval of out-of-state shellfish dealers who have been approved by their respective state shellfish authorities and certified by the Public Health Service; and contracts between the Commonwealth and municipalities and between two or more counties or municipalities for the care of tuberculosis patients.

### Hearings

Public hearings required by statute were held by the Council on the following matters: appeals from owners of hospitals or nursing homes from refusals of State or local authorities to grant necessary approvals; appeals of owners of dairies from refusals of local boards of health or inspectors to issue licenses or permits to sell milk; and on regulations before approval.

In addition, under authority of Chapter 152 of the Acts of 1946, certain division directors have been authorized by the Council to hold certain public hearings. The Directors of Sanitary Engineering, of Food and Drugs, and of Hospital Facilities have been so designated from time to time. The information presented at these hearings was submitted to subsequent meetings of the Public Health Council for action. This method has eliminated the necessity of holding a good many extra Council meetings, with a consequent saving in time to the Council members and in expense to the Commonwealth.

### Hospital Survey and Construction

Applications from hospitals for financial assistance from Federal funds allotted to the Commonwealth by the Surgeon General under the Federal Hospital and Medical Facilities Survey and Construction Act, after approval by the State Advisory Council, have been considered periodically. During this seven-year period allocations of Federal funds have been granted to about 70 hospitals for new buildings, alterations, additions, or equipment.

Annually the revision of the Massachusetts State Plan for the administration of this act has been studied and approved.

### Regulations

Rules and regulations relative to the following matters have been approved and adopted:

Bakeries and bakery products
Purity and quality of food
Pasteurized milk and establishments for the pasteurization of milk
Milk and egg products
Protection of dietetic foods
Licensing of hospitals and sanatoria
Use of blood or other tissue for purposes of transfusion
Distribution of biologic products
Sale of surplus biologic products
Isolation and quarantine requirements
Physical examination of school children
Issuance of premarital medical certificates
Cancer clinics
Minimum housing rules and regulations
Cross connections between public water supplies and fire or industrial water supplies.

In accordance with Chapter 576 of the Acts of 1951, which requires that a public hearing be held relative to rules and regulations which contain a penalty clause or are made under a statute containing such a clause, wherever applicable such a public hearing was held prior to the adoption of regulations.

A complete list of rules and regulations adopted by the Department since 1914 and still in effect is included under the report of the Commissioner of Public Health.

# REPORT OF THE COMMISSIONER OF PUBLIC HEALTH

## Office of the Commissioner

After several years with the Department in various positions, the last ten as Commissioner of Public Health, Dr. Vlado A. Getting left the Department in May, 1953 to accept a position as Professor of Public Health Practice at the University of Michigan and as Consultant to the Detroit Health Department. The ten years of his commissionership in Massachusetts covered a period of changing public health practices. Dr. Getting not only made valuable contribution to progress in this field within Massachusetts, but distinguished himself as one of the outstanding state health officers of the country, and became a recognized leader in public health.

Dr. Samuel B. Kirkwood was appointed to the position of Commissioner of Public Health and assumed the duties of this position on May 8, 1953.

Dr. Alton S. Pope retired from the Department on September 30, 1954, after serving for more than twenty-five years as Director of Tuberculosis and Sanatoria. During the last seventeen of these years he was also Deputy Commissioner. I should like to record the sincere and deep thanks of the Department for Dr. Pope's long and faithful service in the field of public health.

## Reorganization of the Department

Early in 1949 the Department was reorganized by grouping all divisions and sections into four bureaus, each bureau chief to assume responsibility for a specific segment of the Department's functions, and to be directly responsible to the Commissioner. These bureaus were Environmental Sanitation, Preventive Medicine, Tuberculosis and Sanatoria, and Administration.

After considerable study based on experience under the above organization it was found advisable to enlarge the number of bureaus within the Department from four to seven to permit a better grouping of functions and distribution of executive responsibility. This plan of reorganization was approved by the Public Health Council on April 12, 1955 and was put into effect at the beginning of the 1956 fiscal year, July 1, 1955. At the present time the Department is functioning through these seven bureaus:

- Bureau of Administration
  - Commissioner's Office
  - Division of Administration
    - Fiscal Section
    - Personnel Section
    - Legal Section
  - Division of Training and Research
  - Division of Health Information
- Bureau of Environmental Sanitation
  - Division of Sanitary Engineering
  - Division of Food and Drugs
- Bureau of Preventive Disease Control
  - Division of Cancer and Chronic Disease
  - Division of Communicable Diseases
  - Division of Dental Health
  - Division of Alcoholism
- Bureau of Health Services
  - Division of Local Health Services
    - District Health Offices
    - Civil Defense
    - Nursing
    - Social Work
    - Nutrition
    - Division of Maternal and Child Health Services
- Bureau of Hospital Facilities
  - Division of Hospital Facilities

Bureau of Tuberculosis and Institutions
Division of Sanatoria and Tuberculosis
Bureau of Institute of Laboratories
Division of Biologic Laboratories
Division of Diagnostic Laboratories

The Division of Administration, the first division to be created within the Department, on December 14, 1915, had been under the direct supervision of the Commissioner until the creation of the position of Director of Administration, which was filled by Leon A. Bradley, PhD. on February 8, 1955 to relieve the Commissioner of certain details and routine.

### Staff Conferences

Regular conferences have been held by the Commissioner with his bureau chiefs every Monday morning. On the first Monday of each month all division directors participated in these conferences, and on the first Monday of each quarter the meetings included also district health officers, institution superintendents, and section heads.

Department staff meetings have been held either annually or semiannually and have included as many members of the entire Department staff as possible.

### Department Headquarters

The need for increased and unified headquarters for the Department has remained a serious problem. During the past few years the Department has expanded greatly, and the number and complexity of programs have increased, resulting in a demand for more personnel and an increase in the duties of existing personnel. These added responsibilities have intensified the already critical housing condition of the Department. Additional quarters are urgently needed, either by renting or constructing a suitable building. At present, Department offices, exclusive of the laboratories, are scattered in six different buildings in Metropolitan Boston outside the State House. Nowhere in the present quarters are there adequate and safe storage facilities for the vital permanent records of the Department. The overcrowded and scattered offices do not permit residents of the Commonwealth, physicians, members of local boards of health, or members of the General Court to find personnel readily for conference or advice on specific public health matters. Adequate space in a single building would save money, utilize personnel more effectively, and permit more efficient and adequate service.

In 1950 and 1951 partial consolidation of the Department's laboratories was accomplished by uniting the laboratories in Jamaica Plain into the Institute of Laboratories. Efforts are being made to provide additional laboratory buildings at this site. In 1954, the Water and Sewage Laboratories, which were located on the fifth floor of the State House for many years, were transferred to the new building housing the Lawrence Experiment Station, so that the bacteriological and microscopical analyses are now performed under the same roof as the chemical analyses.

### Approving Authority for Medical Schools

The Approving Authority for Medical Schools, consisting of the Secretary of the Board of Registration in Medicine, the Commissioner of Public Health, an osteopathic member of the Board of Registration, and a layman, determines those medical schools whose graduates may become candidates for registration in the practice of medicine in Massachusetts. After hearings by the Approving Authority the following schools were approved during the period of this report:

Southwestern Medical School
Chicago Medical School
University of Toronto
Stritch College of Medicine of Loyola University
University of Georgia Medical School
Dalhousie Medical School of Nova Scotia
Trinity College School of Physic, Dublin

Bowman Gray School of Medicine, Lake Forest College, Winston-Salem, North Carolina
University of Montreal
Kansas City College of Osteopathy and Surgery
University of London
University College, Dublin
University College, Galway
University College, Cork
University of Oxford, England
Cambridge University, England
University of Zurich, Switzerland
University of Basle, Switzerland
American University of Beirut
University of Copenhagen
Chicago College of Osteopathy

Chapter 759 of the Acts of 1955, entitled An Act Relative to Schools for the Training of Medical Laboratory Technologists, provided for three additional members of the Approving Authority to act for the purposes of Chapter 759 only. These three additional members include a hospital administrator or trustee and member of the Massachusetts Hospital Association, an adequately trained and experienced laboratory technologist, and a physician appointed from a list submitted by the Section of Physiology and Pathology of the Massachusetts Medical Society.

### Medical Panels

General Laws, Chapter 32, Section 6, as amended, directs the Commissioner of Public Health to appoint chairmen of medical panels to review applications and examine State and municipal employees applying for disability retirement. The chairman, insofar as possible, must be a physician skilled in the particular branch of medicine or surgery involved in the case; the other two members of the panel are selected by the applicant and by the local retiring authority. By direction of Chapter 181 of the Acts of 1952, all three members of the medical panel must conduct the examination in the presence of each other, but their findings are arrived at independently of one another. Since 1951 the number of applications processed by the Department each year has averaged 825.

In addition to medical panels for applicants for disability retirement, upon application by the widow of a fireman or policeman for an annuity the Department under General Laws, Chapter 32, Section 89 designates the third member of a board to determine whether or not the death of said fireman or policeman was the result of an injury received in the performance of his duty. Such requests average from 40 to 50 per year.

### Rating Board

As Chairman of the Rating Board, created by General Laws, Chapter 32, Section 6, the Commissioner presided at hearings and interviewed applicants from the uniformed branch of the State Police applying for retirement because of illness or injury received in line of duty. After examination of the applicants and review of their records, recommendations relative to retirement were made by the Board. The annual average number of such applications was about seven.

Building and boiler inspectors of the Department of Public Safety and State Police detective lieutenants upon reaching the age of 55 or completing 20 years of service must have an annual physical examination to determine their fitness to continue working to the compulsory retirement age of 65. In this group about nine were annually examined by the Rating Board.

### Milk Regulation Board

The Milk Regulation Board, consisting of the Chairman of the Milk Control Board, the Commissioner of Agriculture, the Attorney General, and the Commis-

sioner of Public Health, has held several meetings each year, attended by the Commissioner of Public Health or the Director of the Food and Drugs Division as his representative.

### Council for the Aging

The Council for the Aging was created by Chapter 591 of the Acts of 1955 and consists of the Commissioners of Education, Mental Health, Public Health, Public Welfare, and Labor and Industries, and four members appointed by the Governor. This council acts in an advisory and consultative capacity, with the general objective of coordinating the several State departments' programs designed to meet the problems of the aging and also to assist and coordinate such activities at community levels.

### State Planning Board

During the early part of the period covered by this report the Department was represented at all regular meetings of the State Planning Board by the Commissioner or by a member of the Division of Sanitary Engineering. The final meeting of this board was held on April 30, 1953, when the State Planning Board was abolished and its powers and duties were transferred to the Division of Planning of the newly created Department of Commerce.

The activities of this board of greatest interest to the Department of Public Health were:

(1) The study relating to development of improved recreational facilities at ocean beaches.

(2) The work under Chapter 134 of the Acts of 1952, requiring that local boards of health approve all real estate subdivisions before final approval by the local planning board, aimed at eliminating the difficulties which have occurred in real estate developments where no sewerage facilities exist and where subsoil conditions are unsuitable for local sewage disposal.

(3) A complete aerial survey of the Commonwealth, including maps of critical target areas for Civil Defense activities.

(4) Maps of primary and secondary roads, population densities, critical target areas, and casualty centers, prepared for the State Civil Defense Agency.

(5) A study by engineers of the Planning Board of all inland bathing beaches in the Commonwealth.

### Regulations

The following rules and regulations have been promulgated by the Department and are still in effect:

Distribution of biologic products
Adopted 4/9/35; amended 5/14/40; 1/11/49; 12/15/53

Sale of surplus biologic products
Adopted 4/12/49; amended 12/15/53

Use of blood or other tissues for purposes of transfusion
Adopted 1/10/39; amended 4/10/39; 10/7/41; 11/4/41; 9/14/48; 3/11/52; 6/12/56

Cancer clinics and service unit values
Adopted 8/10/26; amended 6/14/27; 3/13/28; 1/5/35; 9/14/43; 10/5/43; 11/11/43; 12/14/43; 4/11/44; 1/14/47; 10/18/55

List of diseases dangerous to public health
Adopted 1907; amended 12/15/14; 12/14/15; 2/16/17; 4/3/17; 12/18/17; 10/29/18; 11/18/20; 12/8/21; 9/18/28; 6/11/35; 12/10/35; 11/10/36; 2/14/39; 5/1/41; 5/12/42; 4/14/43; 10/5/43; 12/14/43; 1/11/44; 11/3/48

Diseases declared to be dangerous to the public health and reportable
Adopted 1907; amended 12/15/14; 12/14/15; 2/16/17; 4/3/17; 12/18/17; 10/29/18; 11/18/20; 12/8/21; 9/18/28; 6/11/35; 12/10/35; 11/10/36; 2/14/39; 5/1/41; 5/12/42; 4/14/43; 10/5/43; 12/14/43; 1/11/44; 11/3/48

Isolation and quarantine requirements of diseases declared to be dangerous to public health
Adopted 8/9/38; amended 5/13/41; 1/11/44; 11/3/48; 8/12/52

Transportation of bodies dead of diseases dangerous to public health
Adopted 7/12/38; amended 8/9/38; 2/14/39

Funerals of persons dead of any disease dangerous to public health
Adopted 8/9/38; amended 5/13/41; 1/11/44

Cremation
Adopted 12/5/07; amended 10/29/18

Treatment of persons exposed to rabies
Adopted 8/10/37; amended 5/13/41

Approval of bacteriological and serological laboratories
Adopted 9/12/39

Use of a common drinking cup
Adopted 3/22/16

Use and concerning the providing of a common towel
Adopted 12/16/15; amended 3/22/16

Approval of lodging houses
Adopted 7/6/05

Barbering and barber shops
Approved 12/6/49

Cross connections between public water supplies and fire and industrial water supplies
Adopted 2/9/37; amended 5/12/42; 10/9/51

To prevent pollution or contamination of any or all of the lakes, ponds, streams, tidal waters, and flats within the Commonwealth or of the tributaries of such tidal waters and flats
Adopted 8/14/45; amended 10/14/45

Supervision of plumbing
Adopted 6/11/35; amended 8/6/40; 1/10/50; 5/8/56

Minimum standards of fitness for dwellings
Adopted 12/6/49; 3/8/55

Operation of plants for the purification of shellfish
Adopted 6/5/28; amended 10/7/41

Enrichment of flour, white bread and rolls
Adopted 11/3/48

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Adopted 5/8/35; amended 11/17/48; 6/12/56

Egg Nog
Adopted 6/12/56

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Adopted 6/12/56

Sale of rabbits intended for food purposes
Adopted 5/14/29

Governing the business of cold storage, made under the provisions of General Laws, Chapter 94, Section 67
Adopted 10/10/33

Sterilization of feathers, down, and second-hand material intended for use in the manufacture of articles of bedding and upholstered furniture
Adopted 11/12/35

Making of each article of bedding and upholstered furniture
Adopted 12/10/30; amended 11/12/35

Manufacture and bottling of carbonated non-alcoholic beverages, soda water, mineral, and spring water
Adopted 11/12/35; amended 4/7/36

Uncarbonated fruit beverages
Adopted 5/8/36

Business of slaughtering and meat inspection
Adopted 7/9/31; amended 12/10/35; 9/14/43

Poultry slaughterhouses
Adopted 9/14/43; amended 8/6/46

Approval of contracts for the production and distribution of certified milk
Adopted 10/14/36

Frozen desserts and ice cream mix
Adopted 9/11/34; amended 5/8/56

Bakeries and bakery products
Adopted 2/14/33; amended 1/10/50

Definition of pasteurized milk
Adopted 7/8/41; amended 11/4/41; 6/15/50

Establishments for pasteurization of milk
Adopted 2/12/35; amended 6/15/50; 10/20/53; 6/12/56

Standards and definitions of purity and quality of food
Adopted 2/9/37; amended 5/8/56

Pork products intended to be eaten without cooking
Approved 2/12/24

Dietetic foods
Adopted 5/12/53

Licensing of hospitals and sanatoria
Adopted 4/14/42; amended 2/9/43; 12/14/43; 3/14/50

Licensing of boarding homes for the aged
Adopted 11/3/48

Licensing of convalescent and boarding homes
Adopted 11/3/48

Dispensary license
Adopted 1/12/19; amended 5/13/19; 5/10/38

Dental clinic license
Adopted 8/10/43

General rules for police station houses, lock-ups, houses of detention, jails, houses of correction, prisons, and reformatories
Adopted 1910; amended 4/8/30; 6/15/48

To establish standards for tuberculosis hospitals and sanatoria
Adopted 6/14/27; amended 6/5/28; 8/12/32; 1/17/39; 5/10/38; 10/21/48

Obtaining state subsidy
Adopted 5/11/20; amended 6/5/28; 2/14/33; 3/13/34

Minimum requirements for tuberculosis dispensaries as defined by the Department of Public Health
Adopted 4/6/15; amended 7/11/16; 11/7/19; 7/14/25; 4/11/33

Minimum requirements for uniform dispensary record system
Adopted 7/14/25

Governing the hospitalization of patients with chronic rheumatism
Adopted 5/8/45

Reporting and control of venereal diseases
Adopted 12/18/17; amended 5/12/18; 6/11/18; 3/11/19; 11/12/23; 10/1/25; 10/8/29; 1/14/30; 1/14/36; 8/9/38; 4/11/44; 11/3/48

Treatment of persons suffering from venereal diseases who are unable to pay for private medical care
Adopted 2/14/33; amended 8/10/37; 8/9/38; 9/12/39; 11/6/40; 4/13/48; 11/3/48

Issuance of premarital medical certificates
Adopted 4/11/50

Approved prophylactic remedy for use in the eyes of infants at birth
Adopted 5/12/36

Physical examination of school children
Adopted 3/11/52; amended 8/25/53; 3/9/54; 2/14/56

Labeling of receptacles containing Benzol (Benzene), Carbon Tetrachloride and other harmful substances [approved jointly with Department of Labor and Industries)
Adopted 6/12/56

Regulations promulgated by Director of Marine Fisheries
Approved for sanitary requirements 4/13/42

## Legislation

Annually laws are enacted by the General Court conferring additional responsibilities on the Department. Summaries of the work entailed by these additional duties are included in the reports of the individual divisions concerned. Similarly, resolves have been passed providing for special investigations to be made by the Department individually or jointly with other departments.

Following is the legislation submitted by the Department to the 1957 session of the General Court:

1. An Act Authorizing the Department of Public Health to Establish a Sanitary Code. This bill is recommended to fill the great need for integrated legislation in this field. It will eliminate the massive confusion respecting statutory law, rules and regulations and policy.

2. An Act Requiring Approval from the Department of Public Health Before the Commissioner of Corporations and Taxation Issues a Charter of Incorporation for any Corporate Purpose Which Requires a License from the Department of Public Health. This legislation is proposed to coordinate the actions of the Department of Public Health and the Commissioner of Corporations in the specialized instances where a corporation will require a license from the Department of Public Health.

3. An Act Relative to the Keeping of Records by Hospitals, Dispensaries or Clinics, Sanatoria, Convalescent or Nursing Homes, Infirmaries Maintained in Towns, and Boarding Homes for the Aged. This legislation is needed to protect the public who are treated or boarded at these licensed institutions. It corrects an omission in section 70 of Chapter 111 of the General Laws which was noted by the last legislature.

4. An Act Relative to Recording and Making a Report of Births. Under the present law, a vital statistic is not required, namely the weight of the child at birth, because of the invalid and statistically inaccurate notion that it would reveal conception before marriage in some instances. Public health specialists consider weight as an important factor in their compilations.

5. An Act Relative to the Facts to be Recorded by City and Town Clerks Relative to the Definition of a Live Birth. This legislation is proposed to define what a "live birth" is. The present statute has no definition.

6. An Act Relative to the Treatment of Chronic Diseases at Lakeville State Sanatorium. This legislation is proposed to permit patients with chronic diseases to be admitted to the Lakeville State Sanatorium.

7. An Act Relative to Admissions, and So Forth, at Lemuel Shattuck Hospital, Pondville Hospital, and Westfield State Sanatorium. The Department of Public Health offers this legislation so that its institutions will have conformity in the policy of admissions.

8. An Act Providing for the Admission of Persons with a Chronic Disease to County Tuberculosis Hospitals Under Certain Circumstances. This legislation is needed because of the diminishing numbers of patients admitted into county tuberculosis hospitals and the increasing numbers of hospital beds needed for the treatment of chronic diseases.

9. An Act Authorizing Admissions to County Tuberculosis Hospitals of Persons Afflicted with Chronic Disease and Concerning Charges Thereof. This legislation is needed because of the diminishing numbers of patients admitted into county tuberculosis hospitals and the increasing numbers of hospital beds needed for the treatment of chronic diseases. This amendment would extend the statute respecting charges for admissions of tubercular patients and make it applicable to the admission of chronic disease patients.

10. An Act Respecting Emergency Admissions to County Tuberculosis Hospitals for Persons Afflicted with Pulmonary Tuberculosis or a Chronic Disease. This legislation is needed because of the diminishing numbers of patients admitted into county tuberculosis hospitals and the increasing numbers of hospital beds needed for the treatment of chronic diseases. This amendment would extend the statute respecting charges for admissions of tubercular patients and make it applicable to the admissions of chronic disease patients. This covers emergency admissions.

11. An Act Relative to Admissions to Rutland State Sanatorium and Westfield State Sanatorium. This legislation would eliminate the requirements of six months' residence for admissions to these hospitals. The availability of beds and the vital need for hospitalization far outweigh any requirement of residence which would be advantageous to the Commonwealth.

12. An Act Relating to Charges for Support at State Sanatoria. This legislation is proposed to eliminate the complex bookkeeping involved in the collection of unsettled cases, and particularly because the Department's experience has been that is largely ineffectual in its efforts to get payments in these cases.

## Future Possibilities in the Department

The seven years covered by this report have been interesting years. It has been a confused period but a dynamic one through which many forces have surged, deepening some old channels and obliterating others. No final pattern has appeared; in no sense has 1956 seen the end of an era and the beginning of another. At best, it can afford a brief pause to look about, and then push ahead.

As a result of many factors, some post-war, others of long standing, two significant changes have appeared in the last decade.

The first is seen in the shift from simple and compartmented problems to those much more complex, reaching at the same time into many phases of individual and community life. Problems — and thereby their solutions — which formerly fell into well defined pigeonholes now are seen as a fluid mixture of many elements like the confluence of streams.

A second sign of the times is the appearance of a lay public much better informed on health matters than ever before. Most significant of all, the public has wanted to be better informed. It is taking keen interest individually and collectively in problems of health, an interest that has never been equaled in previous times.

Specific problems are many and are indicators of these changes. Alcoholism is now clearly recognized as a community question requiring many resources for solution. Traffic and home accidents cannot be ignored as a major public health issue, but at the same time this problem cannot be solved by health workers alone.

If the aging population and chronic disease call for new therapy, it cannot be confined to the hospital, for rehabilitation extends into every corner of community life. Not all the long-known communicable diseases have been controlled, and the large group of virus diseases continues to plague us. In our new means of control of all these diseases, we have a public informed through many sources, which is no longer satisfied by treatment but wants preventive action.

These changes represent the challenge of the future to the Health Department.

In the first place, they demand a degree of reorganization within the Department itself. With a tradition of years, a department at any one time finds itself organized in somewhat static divisions which have grown up largely in relation to the leading problems of the past. New, more complex, broad problems require a much more fluid organization. Mechanisms must be found for increasing the flexibility of the Department's structure. An answer lies partly in a regrouping of divisions into larger units on a functional basis. The new organization, for instance, should be sufficiently flexible to permit establishing a Division of Rehabilitation which would include elements of many other divisions. Coordination of this type will be a vital necessity. An increase in the number of coordinating departmental committees or a heavier responsibility laid upon a single executive committee is to be expected.

Just as within the Health Department such a reorganization lies ahead, so the relation of the Department to other departments of the State Government will change. The Health Department will be represented, and should be, on many more ad hoc commissions, which are in themselves a response to the broader problems of total community life.

A careful revaluation of the responsibilities and duties of the State Health Department in relation to those of local health agencies must come. Here a somewhat paradoxical situation will rule. Although the increasing complexities of community living call for mutual acceptance of some degree of centralized control, the sense of home rule and local responsibility will and should continue to be strong. In general the central authority should develop along the lines of a coordinating body, establishing certain policies applying to all communities. A central office, further, should strengthen its function as a resource agency, providing experts for consultation with local health bodies and for study of specific situations and problems. One of its most valuable contributions will be a continuing evaluation of health services throughout the State. Out of all this will come its final role of acting as a stimulant in the development of health programs.

Operation of most of these programs, however, would seem to be a local health responsibility. So the problems of implementation will come to rest on the local level, where the community situation is best known and best understood. How much territory the local area should include will vary. This question must be carefully scrutinized. There is a minimum size, a minimum population, which can provide, from its own resources, satisfactory local health services. Each community will be called upon by its own people to evaluate its own health services objectively. If these are found wanting, the community must provide additional means through cooperative action with neighboring cities and towns.

Against this background, certain health problems stand out clearly. Specialized care must be provided for the aging and for sufferers from chronic disease. The continuing needless deaths of mothers in childbirth and of infants prematurely born and dying in the first weeks of life must be prevented. Disaster and accident control must be developed. The newer aspects of tuberculosis control through home treatment require evaluation. Facilities for sewage treatment and disposal must be extended to meet the needs of industrial expansion and housing developments. Water resources must be increased to satisfy rapidly increasing demand. Developments in the production and use of atomic energy present new health hazards that must be controlled.

None of these problems can be met by a single simple solution.

One of the most immediate needs for the Health Department is the recruiting and training of professional personnel at every level. Public health is a specialized profession with many facets, calling for expertly trained individuals. It is an

area in which competence can be attained only through hard work and continual study. The Training Division of the Health Department will become one of its most active and important sections.

Another duty of the Health Department in the coming years is to develop closer association between the health officer, the local physician, and the layman in coordinating efforts toward better individual and community health. All three of them must aid in creating and maintaining a well informed public opinion on health matters.

With this cooperation, public opinion on health subjects will rest, as it should, on competent professional advice, with respect for the decisions of experts. The community must then be willing to get out and work for the health services it desires.

Respectfully submitted

Samuel B. Kirkwood, M.D.
*Commissioner of Public Health*

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# BUREAU OF ADMINISTRATION

## DIVISION OF ADMINISTRATION

Upon the reorganization of the Department of Public Health in 1914, a Division of Records and Accounts was established. This division was renamed Division of Administration on December 14, 1915, and there has been a Division of Administration under the direct supervision of the Commissioner of Public Health continuously since that date. It was not until February 8, 1955 that Leon A. Bradley, Ph D. was appointed to be the first Director of the Division of Administration. Dr. Bradley was formerly the Head of the Department of Bacteriology and Public Health at the University of Massachusetts. He came to the Department in 1950 to supervise its Field Training Program, and it was from the directorship of that program that he was transferred to the Division of Administration.

There are three major activities of the Division; fiscal, personnel, and legal affairs. The fiscal office formerly consisted of a business office and a fiscal office; the former under the supervision of Mr. Louis A. Phaneuf and the latter under the supervision of Mr. Thomas Mackey. Upon their retirement, Mr. Harry W. Attwood became the first Assistant Director, Business Agent, a title and responsibility he has maintained ever since. The fiscal office prepares the budgets, both State and Federal, under the direction of the Commissioner; is responsible for the execution of the budgets in all details; pre-audits and post-audits expenditures made by the Department; prepares monthly reports for both Federal and State accounts; processes all travel vouchers and State automobile accounts; and prepares payrolls for employees of the Department.

The personnel section processes all requisitions for permanent, temporary, and emergency employment; cooperates with the Division of Civil Service in the preparation of posters for Civil Service examinations; and maintains the personnel records for the Department and its institutions.

The legal section follows all legislation pertaining to public health; assists in the preparation of bills to be introduced by the Department; and generally advises on all legal matters before the Department.

The funds of the Department come primarily from State appropriations and Federal grants and to a lesser extent from private sources. The expenditures for the year ending June 30, 1956 amounted to $7,955,727.33 ($1.64 per capita) for institutional care and $5,469,922.93 ($1.13 per capita) for other public health activities. All funds for institutional care are received from State appropriations. Funds from Federal and private funds, amounting to $2,133,036.93, were expended in the general program. This amount includes $930,468.80 expended for polio vaccine purchased directly by the government for use in the Massachusetts program. The Federal Government contributed 39 per cent of funds expended by the Commonwealth for health services, exclusive of institutional care.

It is interesting to note the increase in the number of employees in the Department from the period of January, 1950 through June, 1956. On January 18, 1950 there were employed in our institutions 1246 persons. Since that time the Lemuel Shattuck Hospital has been constructed and placed in operation, and the Department has been charged with the operation of the Massachusetts Hospital School. As of July 1, 1956 there were employed 2098 persons in our institutions. However, 849 were employed at the Lemuel Shattuck Hospital and the Massachusetts Hospital School. The number of employees in other institutions as of July 1, 1956 was 1249, indicating that there has been very little change in employees at our other institutions. The number of employees in the Department other than in institutions has remained relatively constant in the figure just below 600. In December, 1952 there were 591 employees, whereas in January, 1956 there were 588.

## DIVISION OF TRAINING AND RESEARCH

The guided missile of public health is the trained worker. Direction must be built in with power. This is not a new concept, and for many years the Division of Training has been actively engaged in the training of local and Department personnel. It was not until 1950, however, that steps were taken to coordinate the training activities of the various divisions and sections of the Department and to expand the program to include supervised field experience for health officers, nurses, medical social workers, health educators, and sanitation personnel.

The objectives of the Division of Training since 1950 have been:

(1) To provide pre-service and in-service training courses for all types of public health workers associated with or employed by health agencies.

(2) To serve as an accredited field training unit for approved schools of public health, medical social work, and public health nursing.

(3) To provide supervised field experience recommended as a component of, or as a supplement to, academic instruction for other professional and subprofessional groups.

(4) To be a research center for the development of administrative and organizational patterns for training, special curricula, instruction techniques, and evaluation practices.

The Division of Training is now prepared to serve not only as a coordinating agency but to participate in the planning, preparation, and presentation of comprehensive training programs for employees of State and local health departments and for students from colleges, schools, and universities who are preparing for professional careers in the various public health specialties.

In 1950 a five-year grant from the W. K. Kellogg Foundation made it possible to establish the New England Field Training Center at the University of Massachusetts, with assistance from the Communicable Disease Center of the Public Health Service. The scope of field training was expanded to include not only sanitation personnel but also public health physicians, nurses, and health educators. Field training for medical social workers was also made possible through funds provided by the Children's Bureau.

Perhaps the most significant trend responsible for the enlarged scope of the training program has been the increasing demand for more highly specialized and better trained workers in State and local health agencies. This meant that orientation and apprenticeship training must be extended beyond the Department to the personnel of health agencies serving the public directly. Short courses, institutes, seminars, clinics, and workshops have been established. In fiscal 1954–1955 a total of 165 courses were given to 14 groups comprising 5279 persons. Visitors from health departments and agencies throughout the country and abroad, new employees, and students of public health and preventive medicine received the benefits of the expanded program.

In the field training area, students received supervised experience in local agencies, and field teachers in these agencies attended refresher courses. Not only did the trainees themselves benefit, but the agencies enjoyed a better trained and more extensive instructional staff; both local health units and the Department were aided in the recruitment of professional personnel. The intimate contact between students, agency employees, and administrators helped in the subsequent placement of trainees, especially in the field of environmental sanitation.

Other important developments in this period were the residency program for career physicians in public health, which was approved by the American Medical Association in 1951, and stipend assistance for full-time or part-time study in various institutions by members of the Department and local health units. In 1952–1953, for instance, full-time study was carried on by two physicians, four public health nurses, four medical social workers, two health educators, a sanitary chemist, and a sanitarian; 15 other persons did part-time post-graduate study.

The orientation of foreign visitors served to extend the Department's influence to the far corners of the world. Because of its importance as a world medical center,

Boston attracts a large number of these visitors. They are sponsored and assigned to the Department by the Division of International Health of the Public Health Service, the World Health Organization, and other agencies participating in global health programs. Itineraries are scheduled within the Department and with other public health and medical facilities of the area. During the past year 48 of these trainees have been channeled through this Department for less than two weeks observation periods, and 22 for longer periods. Their varied interests required the preparation and supervising of 38 different schedules in 14 fields of interest.

### The Medical Social Training Project

One of the significant events of our time has been the recognition of social work as a vital part of the public health effort. Massachusetts was the first state to add this activity to its public health department. Special interest therefore attaches to the Medical Social Training Project, which was established in 1949 through a grant from the Children's Bureau, in cooperation with the three schools of social work in Boston and the Harvard School of Public Health. The stated objective was to increase interest in and knowledge of public health among social workers, and thus to help in meeting the shortage of personnel for social work positions in public health agencies.

Through this project academic training has been combined with supervised field work. Its purposes include provision of accredited field experience and classroom instruction for medical social work students, and of non-accredited field experience and orientation for workers in service; collaboration with the schools of social work, participation in staff development, and cooperation with the Department's Section of Social Work and Division of Training on special training projects. An important feature of the Project's program has been provision of both district health offices and institutions as areas for field experience.

From 1950 to 1955, accredited field work training was provided for 18 second-year graduate students in medical social work (11 women and seven men), for one first-year student, and for one student taking an advanced program. The students spent three days a week in the field for nine months and attended classes the remaining two days. Seven of these 20 students came from six different states outside of Massachusetts and from Hawaii.

Field observation visits to districts and hospitals, varying from one day to a month, were made by 164 students from the three schools of social work and the Harvard School of Public Health, and by 25 social workers, an educator, and two lay leaders in social work programs from five states and 14 countries. Three of these visitors were medical social work faculty representatives from schools of social work or public health.

## DIVISION OF HEALTH INFORMATION

Information and education in public health can be distinguished but not separated — they interfuse. In the early part of this period health education was emphasized by the Division of Health Information. Health educators were assigned to district offices and worked in local communities to stimulate formation of regional health units; close relations were established with health educators in outside official and voluntary organizations.

As time went on, however, the stress was thrown more and more on the collection and distribution of information. Health education as such received less attention, partly because of cuts in appropriations, but chiefly because of a lack of properly trained and qualified personnel. It is true that in 1955 a health educator from the central office was working in the Northeastern District, and another was helping to promote the important Children's Accident Prevention Program of Greater New Bedford. But the rest of the staff, although formally classed as health educators, were actually specialists in communication of one kind or another. What the Department needed — and was getting — was the assistance of a service division which could aid in formulating, processing, and disseminating the information and educational material emanating from the various bureaus and divisions.

Another vital function of the Division was that of effecting closer working relationships with the public health forces beyond the walls of the Department. This might take the form of helping an executive secretary to develop a promotional program, preparing a manuscript for a division head and getting it published in a medical magazine, or putting together an exhibit for a convention.

History is more than the recording of events, and it is more important to live history than to write it. Nevertheless, the events must be recorded. The outstanding developments and achievements in our division were the following.

### Personnel

Until 1950, health information was carried on by a section in the Division of Administration, with a part-time head. In that year, a full-time chief was appointed and a production expert was added to the staff. In 1952 the section became a division, with a physician as its director. In succeeding years the staff was strengthened by acquiring a seasoned newspaperman, a skilled photographer, and an equally skilled artist. In the spring of 1954 an editor with long experience was appointed to take charge of manuscript preparation, write and edit reports, and assist with publicity.

### Services

*Photography and Art Work*

An outstanding joint accomplishment of the artist and photographer was a television program on tuberculosis, prepared in collaboration with the Massachusetts Tuberculosis and Health League. The project involved over two months' work and effected a large saving for the Department. This film was later used for health education purposes throughout the State.

Art work included the development of exhibits, the originating of covers and posters, the preparation of charts, graphs, and so forth, and the designing and execution of brochures, flyers, and other audiovisual aids. The artist also acted as technical consultant for the Department and allied agencies.

The photographer's primary function was to supply pictures for the Department's publications. This involved documenting activities in private hospitals or State institutions and field work by Department personnel. Photographs were prepared for exhibits, television programs, news stories, Sunday rotogravure sections, and syndicated magazines. Slides were produced for in-service training programs, for general audiovisual purposes, and as part of the school health education program.

*Library and Film Service*

The library underwent improvements and received numerous additions. Its services were extended to public health workers and physicians both within the Department and from this country or abroad. Approximately 2000 requests for

literature and information were received each year. Also, the librarian handled hundreds of telephone calls from agencies and individuals needing information or assistance.

The film service circulated about 1500 films yearly.

*Publicity*

Besides routine news releases to daily and weekly newspapers through the State, radio and television contacts were made in special situations such as the polio vaccine field trials of 1954 and the hurricane emergencies of 1954 and 1955. Closer ties were established with the *New England Journal of Medicine*, the Harvard School of Public Health, and the news services in the State House. A mailing list of medical and public health organizations and periodicals was compiled for releases of special significance.

*Publications*

In 1953 the weekly *Public Health Bulletin Board* made its appearance, incorporating the news formerly circulated in the *Communicable Disease Bulletin*, and announcements and news items previously published in the *Newsletter*. In this same year *Newsletter* was renamed *Commonhealth* and received a new format. The editorial style of both these publications was improved and their mailing lists were steadily enlarged. By 1955 the circulation of *Commonhealth* was about 4000, including state health departments throughout the nation, and the weekly bulletin, rechristened *This Week in Public Health*, was going to approximately 1400 individuals and organizations in the State.

*Distribution and Printing*

Along with the usual mailing services, the Division assumed responsibility for the annual State-wide distribution of school health record forms — a burden previously borne by the Division of Maternal and Child Health. Routine requests for public health literature increased in number. The printing and binding of pamphlets, leaflets, and other literature advanced both in quality and in quantity.

# BUREAU OF HEALTH SERVICES

In the period up to 1954, Dr. Robert E. Archibald was in charge of the Bureau of Preventive Medicine, which included the Divisions of Local Health Administration, Maternal and Child Health, Communicable Disease Control, Venereal Disease Control, and Dental Health. In 1954, the Divisions of Communicable Disease Control, Venereal Disease Control, and Dental Health were continued in the Bureau of Preventive Medicine with Dr. Herbert L. Lombard as Bureau Chief; and Dr. Archibald was put in charge of the Bureau of Health Services, comprising the Division of Maternal and Child Health Services and the Division of Local Health Services, which includes the Sections of Public Health Nursing, Medical Social Work, Nutrition, and Civil Defense, and the district health offices. The Bureau chief, although acting as a deputy commissioner earlier, replaced Dr. Alton S. Pope officially as Deputy Commissioner in 1954.

## DIVISION OF LOCAL HEALTH SERVICES

In July, 1950 the position of Field Program Supervisor was established in the Division of Local Health Services with Mr. Rudolph K. Holly appointed to the position.

In 1949, as a direct result of the findings and recommendations of the special commission to study and investigate certain public health matters, appointed by Governor Bradford in 1947, the Union Health Department Act was passed and went into effect on November 3, 1949. The following year a State-wide citizens' committee with one representative from each community was appointed by the Governor for the purpose of informing the people of the Commonwealth regarding the intent of this legislation. A health educator was assigned full-time to work with this committee. At the request of interested local groups, 86 towns in the State had official committees appointed by their town moderators to study and investigate the plan and make recommendations to their respective towns as to what action should be taken by the town. Many of these committees reported favorably, and several communities actually voted at town meeting to have their town join with neighboring communities to form a union health department. However, the Union Health Act was amended on July 1, 1953 to become an Act Relative to the Organization of Regional Health Districts. The compulsory feature of the law was removed and as a substitute, a small subsidy of 50 cents per capita could be provided for initial capital outlay by a regional health district. To date, no communities have taken advantage of this permissive legislation to set up a regional health department.

However, during the years covered by this report, many improvements have been made in local health services and facilities; for example, since 1950 new health centers have been established in the following five communities: Brookline, Quincy, Salem, Wayland, and Springfield. A building has been promised to the Randolph Board of Health to be utilized as a health center, but will not be made available until 1957. Many communities for the first time have employed either a medical health officer or a full-time non-medical administrator, with the result that at the present time there is a total of 20 full-time local health units administered by a physician and 33 under the supervision of a non-medical administrator. Eighty-six per cent of the population of the State reside in these communities. The Nashoba Health Unit added three towns to its membership and strengthened its entire health program. At the present time it is functioning very satisfactorily.

Another interesting development was the setting up of associations of boards of health. The Metropolitan Health Officers Association enlarged its membership by including cities and towns outside of the Metropolitan Boston area. An association of boards of health was established in Plymouth County and another in Berkshire County. In addition, a Southeastern Association of Boards of Health was developed. The officers of these associations were requested to serve as an advisory committee to the Department, and semiannual meetings have been held. This advisory committee has been extremely helpful in advising the Department regarding many of its problems. Likewise the Commissioner has an opportunity to assist in solving major problems of our local health departments.

In 1955 the Division prepared a manual of information for local boards of health which was distributed throughout the State.

The home accident prevention study begun in 1948 was continued by the Division of Local Health Administration up to the time that a grant was received from the Kellogg Foundation, when the program was taken over by the Division of Environmental Sanitation. In 1950 the Nursing Section prepared an excellent manual entitled *Home Accident Prevention for Public Health Nurses.* This was given wide distribution throughout Massachusetts, and on request, many copies were forwarded to other States. The Division made a study during 1951 of environmental factors involved in all deaths from accidents in the home. In 1949–1950 and 1951–1952 the Department received certificates of commendation from the National Safety Council for its efforts in home accident prevention.

### Northeastern District

In 1949 the Northeastern District consisted of 45 communities served by a staff of nine professional workers. By 1956 its boundaries had been extended south and west to include 68 communities with a total population of 1,516,102 and served by a district staff of 16 trained public health workers. In September, 1955 the district office was transferred from the town of Wakefield to the North Reading State Sanatorium.

During the six-year period of this report, there has been more emphasis placed on training opportunities. School physicians, obstetricians, physicians attending well-child conferences, local nurses, and sanitarians have been stimulated to participate in planned courses. Graduate social service students continue to be assigned to the district health office for field training. Employees of local boards of health, particularly sanitarians, have been encouraged to take part in university refresher courses. Three seminars for teachers of health education have been held. Concomitant with on-the-job training programs the district staff has assisted local communities in securing services of new trained personnel.

Better acceptance of training opportunities and almost complete cooperation in the single-session specialized educational meetings have been noted. This became evident at the time of the establishment of the new School Health Regulations, when attendance at orientation meetings for superintendents reached almost 100 per cent. Similar meetings were held for individuals concerned when the "Premature Infant Law" became effective and the "Preferred and Minimum Standards for Day Care Centers" were established.

In the area of promotional effort to raise the quality of local health services, all members of the district team participated in the educational activities for the interpretation of the Union Health Law. In 13 communities local study committees were formed. A complete statistical analysis of local expenditures for health services in each community of the district was completed. Some of the interest and better understanding of public health generated by this extensive promotional program continues today. Local boards of health have been stimulated to revise obsolete regulations. Certain communities have taken the necessary steps to establish independent boards of health. Increasingly, employing agencies have sought trained personnel, especially in nursing and sanitation. As of the date of this report, 49 communities have adopted milk pasteurization regulations and 52 communities have initiated approved tuberculosis case registers.

The Northeastern Health Officers and Agents Association has been absorbed by the Metropolitan Health Officers Association.

Programs for the demonstration of topical application of sodium fluoride to the teeth of children were conducted. An increase in the number of communities adding fluorides to the local water supply has been observed. Fourteen communities have voted action on fluoridation; nine of these are actually adding fluorides.

In 1952 the City of Salem undertook a self-survey of health facilities and services. The Salem Health Center materialized largely as a result of this study. Other experimental programs include the Gloucester diabetes survey in 1950 and the contribution to home accident information provided by the Lynn study of 1949.

Six communities participated in the original Salk polio vaccine trials of 1954 with about 75 per cent participation by the eligible children. By 1955 and 1956 mass inoculation programs were undertaken by every community. As an aftermath of the widespread polio epidemic of 1955, all staff members participated in a coordinated plan to assist local communities in setting up plans and facilities for adequate follow-up of cases.

In 1956, all staff members were given specific Civil Defense assignments and oriented to their responsibilities and functions in serving as the nucleus of the medical and health services section of Civil Defense Area I.

The changing emphases and needs of public health generally have been reflected in the demands on specific staff programs. The trend to suburbia has increased local sanitation problems and necessitated more assistance from sanitation staff in the areas of sewage disposal, water supply, and problems of pollution.

The needs of our growing aged population increasingly are the educational concern of the staff.

With a booming population of youngsters there is generally greater interest in assurance of an adequate medical examination of children at the time of preschool registration. The indices of immunization continue to go upward, with almost universal use of the triple antigen.

Mental health is another area of citizen interest with public health implications. Of the seven active local community councils, five have been concerned with mental health projects as their field of "health" activity.

### Southeastern District

Change has been the dominant note in the health districts south of Boston. The suburban towns near Boston saw marked increases in population in the late 1940's, and by 1949 most of the communities within 15 miles of the city were beginning to experience serious growth problems. As these small towns commenced to expand, lacks became obvious — zoning laws seldom had been adopted, housing developments were not controlled, sewage disposal regulations were inadequate, public water systems needed extension, trained personnel including sanitarians and public health nurses were not available. Following these lacks very closely were the inadequate school facilities that confronted the towns and the high tax rates following construction of new schools. Reluctance of towns to spend funds for health programs in view of their heavy school costs slowed health department progress until problems such as private sewage disposal became acute, and it became apparent that the population growth of the southeastern towns was not merely a temporary increase.

In order to meet the problems of the towns as they changed, changes in the district health program were necessary. Specific consultation service regarding housing developments was offered, and there were concentrated efforts to encourage the adoption of suitable health regulations to protect both the towns and the persons moving into the communities. Where local personnel were lacking the local boards of health were encouraged to obtain trained personnel or to provide training for local personnel interested in a future in public health. The district staff, rather than providing direct service to local boards of health, has provided consultation and instruction to local personnel, a time-consuming process but in line with the general policy of turning the health programs back to the local boards of health.

Some specific instances where progress in health departments can be noted are the establishment of health centers and the employment of full-time personnel. Three health centers — Quincy, Wayland, and Brookline — have been built and opened. A number of towns have appointed agents — Hull, Marshfield, Norwood, Milton, Natick, Randolph, Abington, East Bridgewater, Avon, and Somerset — and there have been additional school nurses employed in many towns. Services of existing voluntary nursing agencies have been purchased in still other communities to meet their public health nursing needs. Several communities have adopted fluoridation of their water supplies, including Hingham, Hull, Sharon, Seekonk, Medway, and Cohasset.

Progress in intercommunity interest and understanding is seen in the formation of a number of groups of local and area personnel. The Quincy Inter-Agency Group, composed of health, education, welfare, youth, and related personnel in Quincy and the nearby area, has been an organization that has stimulated much cooperative functioning of the agencies concerned. Similar organizations in southern Norfolk County and in part of Plymouth County made up of local personnel from a number of towns also have been active. The Southeastern Association of Boards of Health and the Plymouth County Association of Boards of Health have proved an excellent means of education and communication among the members of boards of health. Local solution of local health problems is the ultimate goal for these organizations, and they present an encouraging picture for future improvements in the health program.

Major changes in the district lines and consolidation of personnel have occurred during the period between 1954 and 1956. Eight of the cities and towns of the North Metropolitan District were assigned in 1954 to the South Metropolitan District Office, located in Quincy, raising the number of towns in that district from 49 to 57. In July, 1954 the Southeastern District Office in New Bedford moved to a building on the grounds of the Lakeville State Sanatorium in Middleboro. In September, 1955 the South Metropolitan District Office in Quincy moved from the Quincy Health Center into this same building and the new district was consolidated as the Southeastern Health District. In May, 1956 six towns along the western border were transferred to the Central District to conform to Civil Defense area lines. The present district now includes 103 cities and towns served by a field staff of 16 plus a clerical staff of five.

Civil Defense assignments were made in the spring of 1956, incorporating all members of the staff into the medical and health services section of Civil Defense Area II.

### Central District

On July 1, 1949 most of the area now considered as the Central District was served by two district health officers and their staffs. One, the North Central District, had its headquarters in the building in Ayer now used by the Nashoba Health Association. The other, the South Central District, had its headquarters at 476 Main Street in Worcester.

During 1949, the main effort and objective, aside from routine functions, was the promotion of local health units, in connection with the Union Health Law. The work of the district staff along this line assisted in bringing about the following:

(1) The reactivation of the Nashoba Association with an increased membership of towns.

(2) The formation of the Norwoco (Northern Worcester County) Health Association, including the towns of Hubbardston, Phillipston, Royalston, and Templeton.

The Nashoba Association has gone on to increased membership and scale of functioning. The Norwoco Association has remained in its original state as an association for public health and bedside nursing, in spite of the efforts made at its inception to develop it into a local health unit, with some of the more essential local functions of such a unit.

In 1949, as the result of the expansion of the Nashoba Unit, the district office was moved from the Nashoba building to Fitchburg, where it remained until the move to Rutland State Sanatorium in 1955.

The years following 1949 saw the fading out of some of the district activities, together with the taking on of new activities in other fields. For example, with the diminishing of financial resources, the district lost the services of the sanitation officer, and this important field of activity in relationship with local health departments was necessarily neglected, except in the instances of emergencies and special problems.

The inspection and licensing of nursing and boarding homes and town infirmaries became an important activity of both district staffs in cooperation with the two nursing home inspectors. The inspection program was developed to a high degree

and included formal invitations for instruction of the proprietors of such places, together with informal conferences as the occasion required.

There was considerable activity in the field of dental health, through the efforts of the dental hygienists in the district offices and other members of the staff.

Fluoridation of the public water supply has become an accomplished fact in Athol, Templeton, and Shrewsbury. Fluoridation was well on its way to accomplishment in Ayer and in Gardner, but was indefinitely shelved as the result of the efforts of certain groups. A great deal of study work laying the foundation for confirmation of favorable results from fluoridation in Athol has been done.

The chief problem in the field of communicable diseases resulted from the large number of cases of poliomyelitis which occurred in the late summer and fall of 1955. Members of both district staffs were actively engaged in the follow-up and case recording resulting from this outbreak. Some of the nurses were engaged in the care of polio patients.

The tornado in June, 1953 and the floods in 1954 engaged the district staff members, particularly those in the South Central District, in disaster work, in coordination with the Civil Defense Agency.

In September, 1955 the office of the North Central Health District was moved to the Rutland State Sanatorium and its title was changed to Central District (North). In March, 1956 the office of the South Central District was moved to the Rutland State Sanatorium also. The combined offices at Rutland are now designated as the Central District and render services in an area corresponding to that formerly covered by the North and South Central Districts.

### Western District

Since August, 1951 the district health officer in the Amherst office has had the responsibility of supervising the Connecticut Valley and Berkshire districts. In 1955 this entire area was designated as the Western District with the Amherst office as headquarters. The Pittsfield office continued in operation. In this same year the Western District was made to correspond with Civil Defense Area IV, and the district health officer serves as Civil Defense Area Medical Officer.

Considerable progress has been made in improving local health services. As the result of a survey made in Agawam by Professor Ira Hiscock of Yale, a full-time trained agent-sanitarian was employed in 1953. Other towns appointing a full-time trained agent-sanitarian were South Hadley and Amherst. The city of Holyoke for the first time appointed a full-time physician as director of public health. In 1955 the Berkshire District Association of Boards of Health was organized. At the request of this association, a detailed study of the cost of local health services in each community in the county was undertaken and accomplished. This study stimulated considerable interest in the need for improvement of local health services.

Floods in August 1956 caused great damage in Holyoke, Russell, Westfield, and Easthampton.

During the period covered by this report, seven communities in the Western District adopted pasteurization regulations.

A State-aided cancer clinic was established in the Pittsfield General Hospital in February of 1956.

The public health nurses arranged for a series of weekly meetings each spring and fall for local public health nurses. The topics discussed were based on the needs expressed by nurses in local communities.

Through the efforts of the nutritionist, several new school lunch programs were established and were used for the purpose of teaching better nutrition to school personnel and the children.

The social workers and physiotherapists were required to carry a heavy case load in connection with the Greenfield, Pittsfield, and Springfield crippled children's clinics.

It is of interest to note that during this seven-year period, not a single community in the Western District implemented fluoridation of the public water supply although a great deal of discussion and education was carried on throughout the area.

## Nursing Section

This period has seen some changes and progress in the activities of the Nursing Section. The two three-year demonstration programs of public health nursing in local communities (Princeton and Sterling; and Templeton, Royalston, Phillipston, and Hubbardston) were completed and accepted by these local communities as their responsibility.

During the reorganization of the Department of Public Health, Public Health Nursing became a section instead of a bureau, and was transferred from the Division of Administration to the Division of Local Health Services.

Educational activities have increased, and now a pattern for in-service education for local public health nurses has been established. The public health nursing supervisor in each district office is responsible for planning a series of weekly meetings each spring and fall, based on the needs expressed by nurses in local communities.

A Maternity Nursing Institute, sponsored by the Department of Public Health and the Massachusetts Chapter of the American Academy of Pediatrics, and of three days' duration, has been held annually for the past three years at the Boston Lying-in Hospital for local hospital and public health nurses.

Other workshops have been held on the Infant and Preschool Child, the Nurse in the School Health Program, Cancer Nursing, and Field Teachers Instruction in Public Health Nursing Agencies.

Members of the Public Health Nursing Section participated in developing a Home Accident Prevention Manual for Public Health Nurses, a Survey of Maternity Nursing Services, a Salary Study of Public Health Nurses throughout the State, and a Study of Nursing Resources for public health nursing students in universities.

Members of the Section have also participated in and conducted studies of public health nursing services as requested in local communities throughout the State.

Members of the Section continue to serve on many professional committees, representing the Department of Public Health.

*Personnel Changes* — At the close of World War II, all positions for staff nurses in the district health offices were discontinued. The pediatric nursing consultant was assigned to State Civil Defense headquarters. Our consultant nurse in tuberculosis resigned. The activities of the Nursing Section are handicapped by the loss of these two nurses. Nurses working in local communities constantly indicate a need for assistance in both of these areas. With the increasing numbers of tuberculosis patients requiring nursing care in the home and the problems of mothers with young children, it is important that consideration be given to providing these services.

## Social Work Section

By the year 1950, one or more medical social workers had been assigned to each of the eight district health offices, responsible for all of the social services which might be offered or requested of the Department. Direct case work service to patients was increasingly supplemented by consultation service on the health and social problems of individuals, many of whom were not under any program of public medical care. Physicians asked for help in making plans for terminal care of private cancer patients; hospitals sent parents of children requiring institutional care. In addition, in the districts, social workers were increasingly identified with community activities in stimulating and expanding health and welfare resources, and with educational projects both inside and otuside the Department. This expansion continued until 1955, when district offices were transferred to isolated locations and increased expense for personal or telephone contacts necessitated a different approach to the social and health problems of the areas.

The educational project of the Section has shown steady progress. In 1950, three students from the Boston schools of social work were accepted for eight months' field work training in public health. Each year since then, three or four students have received field training in public health social work. In 1952, through a further grant from the Children's Bureau, it became possible to offer four fellowships in public health social work to qualified students who had completed one year of post-

graduate study in a school of social work. In addition to students under this plan, the Medical Social Work Training Project has been responsible for observation or field experience of varying lengths for some 150 other persons. Also, there has been close collaboration with the schools of social work in developing public health content in the curriculum.

With the opening of the Lemuel Shattuck Hospital, the Section offered consultation service in the selection of a head social worker, and social service became an integral part of the program in this as in other Department institutions. The transfer of the Massachusetts Hospital School from the Department of Public Welfare in 1954 was a further step in the integration of services for the orthopedically handicapped, beginning with social services in the clinics for crippled children and continuing in the social service departments of the institutions. Even when children were referred for surgery to non-governmental hospitals, this integration continued to function through careful policy planning with the hospital social service departments.

During this period, there has been increased participation in program making and policy planning in connection with a wide range of projects and organizations. Among those for which section help in planning or section consultative or supervisory service has been requested are the following: projects for research in heart disease and abnormal pregnancy; services for children with hearing loss; a study of the problems faced by the parents of handicapped children; a study of social service needs in a county tuberculosis sanatorium.

Service on the School Health Council, on the State Planning Committee for Polio, and on the Tufts College Committee on Cleft Palate Problems, advice and assistance to the National Foundation for Infantile Paralysis, to Group Approach in Rehabilitation, to the Massachusetts Cerebral Palsy Association, and many similar agencies are other indications of the broadening influence of the Social Work Section.

The major area of social work activity remains in relation to services to mothers and children in well-child programs, in school health, and in providing social services to children and their families where there are psychosocial problems related to illness and handicap. Increasingly during the past decade, the social workers in the Department have become active in the problems of the aged and chronically ill, both in individual services and in community planning.

## Nutrition Section

Direct service has given way to consultation service in the years since 1949. The change of emphasis made possible the extension of nutrition education throughout the health services. Direct service was continued chiefly to patients in Crippled Children's Services, a few local well-child conferences, and to individuals on request.

Nutrition education for more people resulted when consultation and instaff training were begun. A nutritionist was in each district office to give training not only to district staff members but to the staff of local public and private agencies, particularly those which reached families. By keeping members informed of nutrition developments, by interpreting nutrition research, and by supplying nutrition education materials, they in turn were able to recognize the nutrition implications in their particular disciplines and could motivate those within their sphere of influence to practice better food habits.

Nutrition workshops, institutes, conferences, and in-service education programs for nurses, teachers, dietitians, community nutritionists, home economists, and school lunch personnel were a part of each year's program. Meetings and demonstrations were arranged for those having adults or children in group care in boarding and nursing homes, day care centers, and children's homes.

The school lunch program in all its phases was a major interest. Working with the Office of School Lunch Programs local participation was stimulated, help given in maintaining standards and increasing pupil acceptance, and nutrition education promoted with the school lunchroom serving as a laboratory where nutrition knowledge could be put into practice.

Food habit surveys proved valuable in arousing local interest in better nutrition. These surveys were joint projects of parents, school administrators, teachers, and school lunch personnel. Another type of survey was made during this interval as a part of the hypertension study.

Increased interest in problems of the aging involved their better nutrition and work with weight control, chronic disease, heart, and cancer programs.

Curriculum planning and revision of courses of study was done with those teaching nutrition in schools for nurses and licensed attendants.

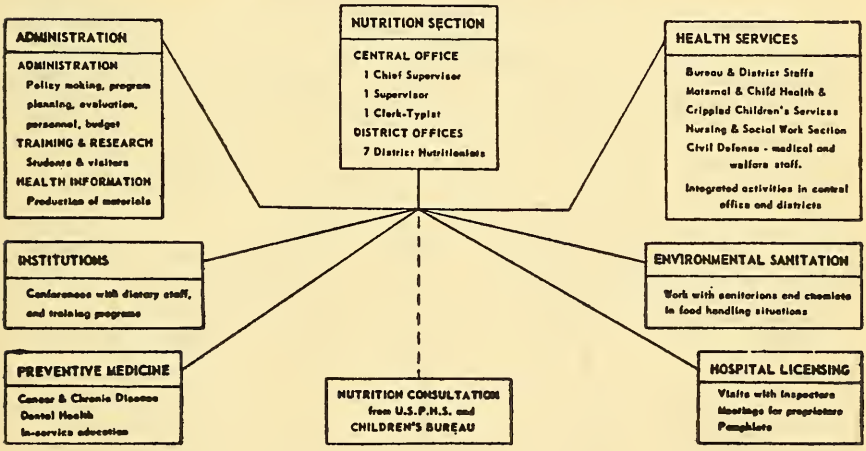
Civil defense and disaster planning were a part of the nutrition program. Materials for use in training local groups in mass feeding were prepared as a joint effort of the Department of Public Welfare, the Red Cross, and the Massachusetts Dietetic Association.

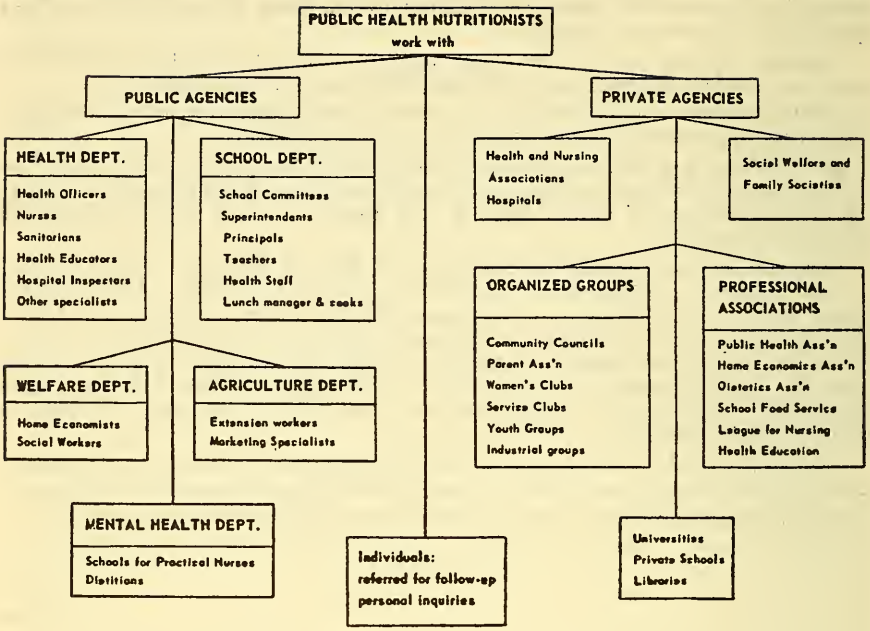
Students and public health workers from 24 different countries and all sections of the United States visited the Nutrition Section for orientation. Graduate students from the Universities of Tennessee, Western Reserve, Harvard, Cornell, Columbia, and North Carolina, and Simmons College came for field work to complete the requirement toward an advanced degree in nutrition. Dietary interns from the Boston Dispensary and from Peter Bent Brigham, Mount Auburn, Beth Israel, and Massachusetts General hospitals came for a day's field experience in public health nutrition.

Leaflets, pamphlets, and slides were developed to meet particular needs, and commercial films, filmstrips, and posters were evaluated for use in teaching nutrition.

The accompanying chart shows the role of the nutritionist in public health.

COOPERATIVE ACTIVITIES WITH DEPARTMENT STAFF




PUBLIC HEALTH NUTRITIONISTS
work with
PUBLIC AGENCIES
PRIVATE AGENCIES
HEALTH DEPT.
Health Officers
Nurses
Sanitarians
Health Educators
Hospital Inspectors
Other specialists
SCHOOL DEPT.
School Committees
Superintendents
Principals
Teachers
Health Staff
Lunch manager & cooks
Health and Nursing Associations Hospitals
Social Welfare and Family Societies
ORGANIZED GROUPS
Community Councils
Parent Ass'n
Women's Clubs
Service Clubs
Youth Groups
Industrial groups
PROFESSIONAL ASSOCIATIONS
Public Health Ass'n
Home Economics Ass'n
Dietetics Ass'n
School Food Service
League for Nursing
Health Education
WELFARE DEPT.
Home Economists
Social Workers
AGRICULTURE DEPT.
Extension workers
Marketing Specialists
MENTAL HEALTH DEPT.
Schools for Practical Nurses
Dietitians
Individuals:
referred for follow-up
personal inquiries
Universities
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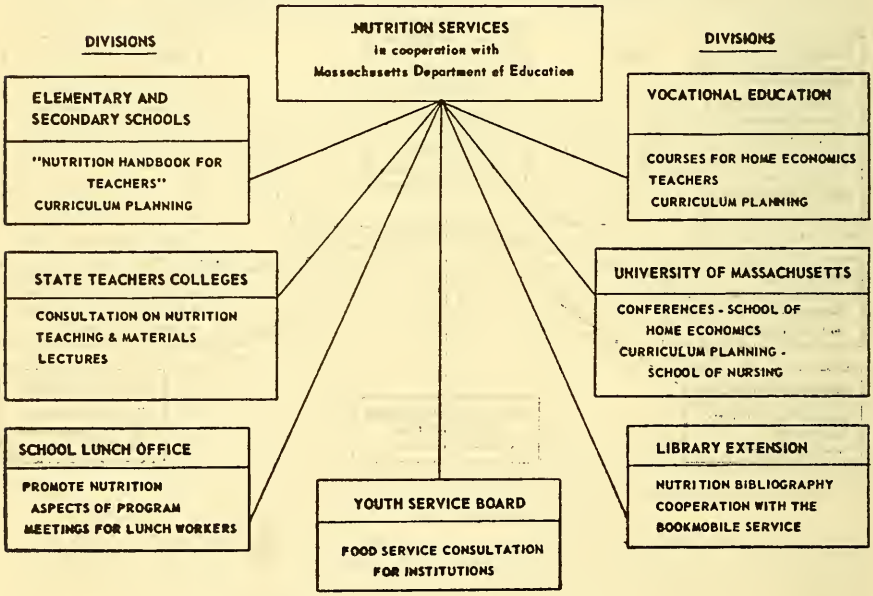

NUTRITION SERVICES
in cooperation with
Massachusetts Department of Education
DIVISIONS
DIVISIONS
ELEMENTARY AND SECONDARY SCHOOLS
"NUTRITION HANDBOOK FOR TEACHERS"
CURRICULUM PLANNING
VOCATIONAL EDUCATION
COURSES FOR HOME ECONOMICS TEACHERS
CURRICULUM PLANNING
STATE TEACHERS COLLEGES
CONSULTATION ON NUTRITION TEACHING & MATERIALS
LECTURES
UNIVERSITY OF MASSACHUSETTS
CONFERENCES - SCHOOL OF HOME ECONOMICS
CURRICULUM PLANNING - SCHOOL OF NURSING
SCHOOL LUNCH OFFICE
PROMOTE NUTRITION ASPECTS OF PROGRAM
MEETINGS FOR LUNCH WORKERS
YOUTH SERVICE BOARD
FOOD SERVICE CONSULTATION FOR INSTITUTIONS
LIBRARY EXTENSION
NUTRITION BIBLIOGRAPHY
COOPERATION WITH THE BOOKMOBILE SERVICE

## Civil Defense Section

The Massachusetts Civil Defense Agency was established in 1950 as a staff agency for the Governor to enable him to carry out his responsibilities under the Massachusetts Civil Defense Act.

The Commonwealth of Massachusetts Executive Order No. 25, dated January 3, 1955, delegated to the Department of Public Health the responsibility for providing the Director, Massachusetts Civil Defense Agency, with a full-time staff with which to operate the Medical Services. This staff is responsible to the Director of Civil Defense and to the Commissioner of Public Health.

All bureaus of the Department of Public Health have an integral part in the Civil Defense structure, and all members of the Department are assigned secondary and highly important functions in Civil Defense, which whenever possible parallel their regular assigned duties with the view of utilizing their skilled and highly specialized knowledge.

In addition to the personnel problem the Medical Services of the Massachusetts Civil Defense Agency is concerned with the over-all picture of public health problems that would be likely to arise out of natural or enemy-caused disasters. The Service is responsible for casualty care and all the auxiliary services that such care implies; for example, establishment of casualty stations, transportation of casualties, complementing available hospital facilities, and substituting for those destroyed.

The Service comprises many divisions such as Disease Control, Environmental Sanitation, Mortuary, and Blood sections, and is intimately concerned with the personnel problem on a State-wide basis, maintaining a constant recruiting service for personnel allied to the medical profession. Close liaison is maintained with other services such as Rescue, Radiac, Water, and Engineering. The relation with the Welfare Service is particularly close, as the problems arising out of the care of evacuees and casualties of disaster are immediately obvious and of such magnitude as to stagger the imagination.

The maintenance of supplies is extremely important, and they are strategically placed throughout the Commonwealth so as to be available upon request of communities when needed and within the shortest possible time. Nearly 300 first-aid stations are scattered throughout the Commonwealth. Several 200-bed emergency hospitals are in storage, and the program of procurement of additional hospitals continues. These hospitals are for emergency use only and are to be operated where required, as they are mobile. It is planned to conduct them in existing hospitals or in new schools which seem to be peculiarly adapted to their operation. Two hundred and thirty-one of these hospitals are slated for storage.

The Medical Services has secured and stored $1,500,000 worth of emergency medical supplies, including emergency equipment for procuring blood. Equipment for testing radioactivity of air, food, and water has been purchased, but the Radiac Service is no longer a part of the Medical Services. An extensive training program is in progress for personnel to be attached to Civil Defense hospitals, first-aid stations, and in other categories required in fulfilling the responsibilities of the Medical Services. Over 500,000 persons in Massachusetts have had their blood typed under the Massachusetts Civil Defense Agency Blood Typing Program, which has been carried out under the auspices of the Institute of Laboratories.

Numerous committees of outstanding men and women in the medical, nursing, and other professions are in existence, their function being to advise on problems peculiar to civil defense.

The activities of the service are numerous and complex and require a continuity in planning and training to meet the problems that would arise out of an enemy attack or in the case of natural disaster of a magnitude sufficient to require the resources of the Massachusetts Civil Defense Agency and the Medical Services.

## DIVISION OF MATERNAL AND CHILD HEALTH SERVICES

### Maternity Care

The maternal mortality rate in Massachusetts varied between 3.3 and 5.5 per 10,000 live births during 1950 to 1954. However, the maternal mortality study carried on jointly by the Department and the Massachusetts Medical Society since 1937 still shows a significant number of maternal deaths to have been preventable. Hemorrhage, toxemia, and anesthesia continue to be the leading causes of preventable deaths of Massachusetts mothers.

Efforts to reduce maternal mobidity and mortality in Massachusetts were directed primarily toward improvement of all aspects of prenatal care through assistance given to practicing physicians, nurses, nutritionists, and social workers. This assistance was offered in the following ways: through providing discussions by visiting consultants with practicing physicians at their regular hospital staff meetings, through seminars and institutes on maternity care for each of the above-mentioned professional groups, and through conferences on total maternity care for groups of supervisory personnel representing all these disciplines.

Seminars, institutes, and conferences were organized and sponsored in cooperation with the Massachusetts Medical Society, schools of nursing and of social work, the Harvard School of Public Health, hospitals, and the Children's Bureau. Courses in maternal care were given for physicians at the Boston Lying-in Hospital over a five-year period and were attended by some 650 doctors. Similar courses at Simmons College were attended by 102 registered nurses. Those given at the Boston Lying-in Hospital were attended by 154 nurses representing 65 hospitals, 20 visiting nurse associations, and two boards of health. Scholarships at the Harvard School of Public Health were given to three physicians for a course in maternal and child health. Scholarships in maternity nursing were provided to 14 nurses at Boston University. Through this Division, by means of special appropriation from the Children's Bureau, the Department continued to assist in the support of teaching programs in maternity and infant care at Boston University and in maternal and child health at the Harvard School of Public Health. Consultation was provided to several prenatal clinics by the Assistant Director and Maternity Nursing Consultant, and they assisted in the organization and conduct of a demonstration parents' class in Northampton in cooperation with that community's physicians, Visiting Nurse Association, and hospital.

Among the publications prepared during these years in which the Division was directly or indirectly concerned was a guide for *Organization and Conduct of Prenatal Clinics*, revised in 1950 and distributed through the district health offices. In 1955, the Committee on Maternal Welfare of the Massachusetts Medical Society prepared *Minimum Standards for Prenatal Care*. In addition, a useful *Bibliography on Maternity and Infant Care* was revised, and prenatal and postnatal letters were distributed on request to approximately 64,000 Massachusetts mothers.

Legislation of concern to the Division which was sponsored by the Department included an Act to Further Regulate the Filing of Notice of Intention of Marriage and the Issuance of Certificates of Such Filing, an Act to Require Reports of Births Occurring in Airplanes, passed in 1950, and an Act to Require Hospitals to Determine Blood Type of Patients, passed in 1955.

### Infant Care

Since 1950 the birth rate has continued to rise. In 1954, when 107,086 live infants were born to Massachusetts residents, the rate was 22.1 per 1000 population. More than 99 per cent of these babies were born in hospitals. About 7 per cent of infants born in Massachusetts are pre-mature, and one of every five dies during the first week of life.

The infant mortality rate has not decreased appreciably in recent years. The rate per 1000 live births in 1949 was 24.4, and in 1954, the last year for which rates are available at present, it was 23.3. Because the principal cause of infant deaths is prematurity, the Division stressed services aimed at reducing the incidence of prematurity and improving the survival rate of these infants. Its program included

the support and administration of postgraduate training and the provision of consultation service.

Twelve teams of pediatricians and nurses, supervisors of premature units, attended institutes on the care of premature infants sponsored by the New York State Department of Health and the Children's Bureau. Hospitals which sent teams were St. Luke's Hospital of New Bedford; St. Vincent's, Hahnemann, and Worcester City hospitals of Worcester; the Mercy and Wesson hospitals of Springfield; St. Luke's Hospital of Pittsfield; the Boston City, St. Margaret's, and New England Center hospitals of Boston, and the Cambridge City Hospital. In addition, a team from the Department attended such an institute.

Seminars on prematurity were conducted in a number of hospitals throughout the Commonwealth upon request of their respective medical staffs. About 400 physicians, 100 nurses, and 20 hospital administrators attended these seminars. Two nurses were sent to Los Angeles for a refresher course in care of the premature infant. The Maternity Nurse Consultant continued to organize and supervise conferences on this subject for groups of nurses throughout Massachusetts.

The Assistant Director and Maternity Nurse Consultant served as consultants to hospitals having a maternity service in relation to techniques of care of the maternity patient and newborn infant, especially the infant prematurely born. Also, consultation was given in cooperation with the Division of Hospital Licensing in respect to new maternity units under construction and old units being remodeled.

Other activities in this area included preparation of a pamphlet, *C/O Your Baby*, which was distributed in addition to pamphlets available from the Children's Bureau. In keeping with previous activities, financial support was provided 21 well baby clinics throughout the Commonwealth.

The "Premature Law" was revised in 1949 and further amended in 1955. The change in 1955 raised the weight criterion for financial assistance from 4½ to 5 pounds. Reporting of births of premature infants to boards of health is still incomplete. It is more complete from larger hospitals. Also, their reporting of infants of 4½ pounds or less at birth is more complete than that of heavier premature babies. For example, in 1955, when 87 per cent of prematures were so reported, 94 per cent of infants weighing 4½ pounds or less were reported, in contrast to 76 per cent of those weighing over 5 pounds. That the financial assistance provided for the hospital care of these infants has been considerable may be seen in Table I.

TABLE I

*Payments for Hospital Care of Premature Infants by Community Boards and Departments of Health and the Massachusetts Department of Public Health*

| Year | No. of Cases | Total Cost |
|---|---|---|
| 1950 | 608 | $165,998 |
| 1951 | 593 | 155,557 |
| 1952 | 607 | 180,734 |
| 1953 | 680 | 180,129 |
| 1954 | 646 | 176,695 |
| 1955 | 698 | 190,103 |

PRESCHOOL CARE

*Well-Child Conferences* — Following demonstration of the value of well-child conferences, 161 communities have organized such clinics. We have assisted many of these conferences to establish and maintain standards, and in 40 communities have also provided financial assistance. In seven of these conferences, held in Hanson, Mattapoisett, Norton, Mansfield, West Bridgewater, Westport, and Attleboro, vision and hearing tests were given to a total of 547 children. As a result of community participation, these conferences now request only occasional consultation support from the Department. In addition to these services, the Department has cooperated with the Harvard School of Public Health in promoting courses given each year for physicians who wish to learn more about health supervision of well children.

*Day Care* — In 1950, legislation was revised concerning board of health licensing of non-public agencies giving day care to young children. Boards of health were circularized to determine the number and location of these agencies in 1951 and again in 1952. In 1951, 429 centers were reported by 128 communities. In 1952, 869 such agencies were reported by 185 towns. At that time, 307 agencies were reported by Massachusetts' 17 largest communities. However, it is not to be supposed that such agencies occur only in the larger centers of population, for they appear as regularly in our smallest communities. Effort has been made to encourage and assist communities in establishing rules and regulations and standards for their licensure.

Through the Committee on Day Care Standards and Licensing Procedures of the United Community Services of Metropolitan Boston, and in cooperation with the Associated Day Care Services of Metropolitan Boston, the Massachusetts Departments of Education, Mental Health, and Public Welfare, and the United Community Services of Metropolitan Boston, two pamphlets, *Recommended Minimum and Preferred Standards for Agencies Giving Day Care to Children Under Seven Years of Age* and *Your Child Deserves the Best in Day Care, a Pamphlet for Parents*, were prepared and widely distributed to public and private agencies within the spheres of influence of all the organizations sponsoring these pamphlets. The first pamphlet was intended to assist boards of health which license private day care agencies for preschool age children. The second was developed to assist parents in choosing an appropriate private nursery school, kindergarten, or day-care center. These pamphlets have been well received elsewhere in the country and widely distributed on request of other state and private organizations concerned with the field. This committee has continued to work to the end of good standards for the daytime care of the preschool child apart from his home.

In 1955, the Metropolitan Boston Health Officers Association and the Boston Association for Nursery Education formed a Joint Committee on Day Care for the purpose of assisting communities with problems in respect to these agencies. This committee has set up a consultation service of experts in the field of early childhood education whose services have been made available to boards of health, and has been instrumental in effecting a course to be offered for licensing personnel.

### Conservation of Hearing and Vision

Until 1950, very little assistance and very few services were available for handicapped children of preschool age. The immediate result was that many preschool children with severe hearing losses did not have the opportunity to learn speech during the preschool period, which is, from a developmental standpoint, the most favorable time for this type of learning. Another result of this deficiency was that preschool children with impaired hearing were in no position to become habilitated at the public school level when they became of school age.

In 1951 a preschool hearing center for hard of hearing and deaf children was established in Pittsfield. This nursery school was set up in cooperation with local agencies, professional personnel, and the parents of hard-of-hearing children. Since the establishment of this center, eight others have been organized: Taunton, Waltham, and Watertown in 1952; Quincy in 1953; Lowell in 1954; Boston and Salem in 1955; and Fitchburg in 1956. These nursery schools were equipped with the finest auditory training equipment, toys, medical consultation, and teaching staff. The teachers worked with both children and parents on a program of auditory training, lip-reading, rhythm exercises, and speech training. Parents played a key role in the therapy and were encouraged to undertake a definite educational role in the day-to-day strengthening of the children's impairments. One of the key objectives of the training was to prepare children for entrance into public schools whenever possible rather than institutionalizing them in schools for the deaf.

The nurseries for impaired children have proved quite successful, and it is believed that many children have had their lives materially altered for the better as a result of the training which they have received at these installations.

Another important addition to the services given by the Child Growth and Development Section is the auditory training program. Under this program, complex

electronic auditory trainers are installed in the homes of hard-of-hearing and deaf children. In many cases this amplifying equipment enables the child to hear the voices of his parents and brothers and sisters for the very first time. The auditory trainers are sometimes connected to the family television set so that the impaired child may improve in his lip-reading abilities and at the same time derive recreation and enjoyment from appropriate programs. The extensive use of auditory training procedures in the home and in our nursery schools points the way, in many instances, to the early acceptance of a hearing aid and ultimate habilitation at the public school level. Through these methods the child with a hearing handicap is literally bathed in sound from his very earliest years and thus makes the best possible use of his residual hearing.

Field reports from parents and educators on the value of our nursery schools and auditory training program have thus far been uniformly favorable. Both the speech and the speech reception of hard-of-hearing and deaf children enrolled in these programs have improved markedly during the course of training.

For many years preschool children and school children who had hearing losses sufficient to warrant the use of a hearing aid were not able to obtain one. However, in 1954 the Legislature appropriated a small sum of money which was designated for use in purchasing hearing aids for hard-of-hearing and deaf children. This section was thereupon required to establish procedures to insure adequate case finding, the economical purchase of hearing aids, and the fair and adequate geographical coverage among recipients. The Section also was required to provide for efficient methods for instructing the recipients of hearing aids in the proper use of the equipment and to provide for the proper maintenance of equipment. The initial program met only a small part of the acute needs of hard-of-hearing and deaf children throughout the Commonwealth. So great was the need that by October of 1954 the complete appropriation for hearing aids had been exhausted. Fortunately, the Legislature has seen fit to increase subsequent appropriations for hearing aids, but available funds are still lacking to meet the needs of all our children.

Experience gained in the first years of the hearing aid distribution program has proved invaluable. In the second year of operation, the purchase price of each aid was limited to a maximum of $120, since in the great majority of cases a satisfactory hearing aid can be purchased for this price. All recipients of hearing aids must be evaluated at the Winthrop Foundation at the Massachusetts Eye and Ear Infirmary, the Hearing Clinic at the Children's Medical Center, or the Clarke School for the Deaf at Northampton.

The State-wide hearing conservation program has continued its steady growth. With the exception of relatively few towns, all the cities and towns in the Commonwealth have received assistance in developing and expanding their school hearing conservation programs. In most instances these programs meet the requirements of State health regulations which govern such activities. In the matter of equipment, there are now almost 300 modern electronic audiometers owned and used by the schools throughout the Commonwealth. Local testing personnel are now being trained at the rate of about 200 testers per year.

The work which this section is doing has been recognized throughout the country. For example, supervisors of the hearing conservation programs from Georgia, California, Rhode Island, and Texas have visited this Division to learn more about our program.

The Massachusetts school vision conservation program has also expanded greatly in this seven-year period. At the present time practically all cities and towns are using the Massachusetts Vision Test for screening school children. Over 400 approved Massachusetts Vision Test units are owned by cities and towns throughout the Commonwealth. Every community in the State has one or more local persons who have been given training in test procedures by personnel from the Child Growth and Development Section. The annual rate of training school personnel in these techniques is also currently running at the rate of 200 testers per year. A large number of visitors from other states come to Massachusetts annually to see our school screening system in operation and to investigate various other phases of our vision and hearing conservation programs.

## School Health

The school health work of this Division has not been adequate so far as consultation is concerned, as we have had a physician in charge of this program for less than four years; that is, from September 1950 through April 1954.

In 1952, legislation was passed requiring every child in the public schools to be "separately and carefully examined in such manner and at such intervals . . . as may be determined by the Department of Public Health after consultation with the Department of Education and the medical profession."

In-service training courses in school health education have been given at the following State teachers colleges: Worcester (two courses), Framingham (two courses), Fitchburg, Lowell, Bridgewater (three courses), North Adams, and Salem. Teacher training courses were also given in cooperation with Springfield College (two courses) and Boston University (four courses). Also, in cooperation with Harvard-Boston University Extension Division, courses were given in Worcester, Lowell, and Danvers. Summer school health workshops were conducted at Boston University and the University of Massachusetts.

Two Teacher School Health Institutes have been held for the Archdiocese of Boston, in Cambridge and in Quincy. In addition, throughout the State, local in-service training of teachers and evaluation studies of school health programs were given to local schools. The Department also cooperated in a pioneer demonstration for the in-service training of teachers in Mental Health.

In 1951 the Department was authorized by the Legislature to draw up new regulations for the physical examination of school children. A new health record card was devised, and regional conferences were held for school superintendents, physicians, and nurses at which the current regulations were described.

Beginning in 1955, a new series of regional workshops in the administrative aspects of school health services was instituted in cooperation with the School Health Council. This Council, formed in 1940, coordinates the activities of the Departments of Public Health, Mental Health, and Education in the area of school health and advises the respective commissioners on matters of policy in this field.

As another project of the School Health Council, the former School Health Manual has been rewritten under the title *An Administrator's Guide to the School Health Program.* In connection with this new publication, the Coordinator of School Health has been the coordinator and editor.

## Services for Crippled Children

Analysis of the statistics for the seven-year period covered by this report shows a steadily increasing service to crippled children in Massachusetts. During this period a total of 30,059 clinic visits were made in the twelve orthopedic and two plastic clinics, in contrast to 16,923 clinic visits during the previous seven years.

The number of new cases admitted to Services for Crippled Children increased from 906 in 1949 to 1,120 in 1955. The number of active cases increased from 1988 as of January 1, 1949 to 3447 as of December 31, 1955.

During the past seven years the clinic load has increased to such an extent that it has become necessary to have more than the allotted eleven monthly orthopedic clinic sessions per year. Two orthopedic consultants were assigned to the Haverhill and Fall River clinics. Other clinics scheduled extra sessions as needed to accommodate the increased case load.

In 1952, a State-wide children's cardiac program was started. Under this program, children with congenital malformations of the heart or other cardiac conditions which might be benefited by surgery may receive diagnostic services and/or cardiac surgery if recommended.

The cost of hospital care for crippled children hospitalized has increased from a maximum all-inclusive per diem of $14 paid up to January 1, 1954, at which time a per diem rate based on hospital costs became effective. The total hospital days of patients hospitalized by Services for Crippled Children was 12,928 in 1949 and 17,928 in 1955.

Treatments given by physical therapists increased from 4,090 for the year 1949 to 6,807 for 1955. This increase was made possible by the establishment of treatment centers where more children could be treated than by making home visits on each child.

Yearly statistics for the period covered by this report are shown in Table II.

TABLE II

*Services for Crippled Children, 1950–1955*

Orthopedic

| Year | Clinic Visits | Case Load | New Cases | Old Cases |
|---|---|---|---|---|
| 1950 | 3567 | 2096 | 685 | 1411 |
| 1951 | 3576 | 2190 | 653 | 1537 |
| 1952 | 3984 | 2354 | 646 | 1708 |
| 1953 | 4028 | 2530 | 702 | 1828 |
| 1954 | 4498 | 2647 | 677 | 1970 |
| 1955 | 4660 | 2796 | 693 | 2103 |

Rheumatic Fever

| Year | Clinic Visits | Case Load | New Cases | Old Cases |
|---|---|---|---|---|
| 1950 | 933 | 352 | 193 | 159 |
| 1951 | 937 | 403 | 172 | 231 |
| 1952 | 827 | 404 | 125 | 279 |
| 1953 | 790 | 430 | 146 | 284 |
| 1954 | 713 | 429 | 125 | 304 |
| 1955 | 739 | 481 | 162 | 319 |

Plastic

| Year | Clinic Visits | Case Load | New Cases | Old Cases |
|---|---|---|---|---|
| 1950 | 271 | 192 | 55 | 137 |
| 1951 | 297 | 205 | 41 | 164 |
| 1952 | 402 | 242 | 58 | 184 |
| 1953 | 425 | 280 | 55 | 225 |
| 1954 | 476 | 302 | 68 | 234 |
| 1955 | 509 | 325 | 64 | 261 |

Congenital Heart

| Year | Case Load | Days Hospital Care |
|---|---|---|
| 1952 | 23 | 265 |
| 1953 | 40 | 535 |
| 1954 | 54 | 377 |
| 1955 | 67 | 682 |

The responsibility of the Department of Public Health in relation to the Annual Census of Physically Handicapped Children and the Home Teaching Program continues to be carried in the Division of Maternal and Child Health Services under the direction of the Supervisor of Clinics, Services for Crippled Children. Activities in the discharge of this responsibility include:

(1) Consultation to the Department of Education and local school personnel on the health, medical and social needs of handicapped children; evaluation of the need for certain children to receive education through home instruction rather than in regular public school classes, or in special schools or classes; and the determination that all handicapped children are having needed medical care. The consultation services to local school personnel and other agencies are given under the direction of the district health officers by the Public Health Nursing and Social Work Supervisors in the health districts. In the seven-year period covered in this report, an average of 1807 children a year received instruction at home, in hospitals or convalescent homes.

(2) The maintenance of a register of physically handicapped children, under 21 years of age, known to the Department. Sources of information for the register, in addition to the Annual Census of Physically Handicapped Children, include reports of infants with congenital deformities, children served by the State Crippled Children's Clinics, and those reported by other state and private agencies serving handicapped children.

| | | |
|---|---|---|
| Number on Register, December 31, 1949 | | 29,347 |
| Number of orthopedically handicapped | 17,165 | |
| Number of non-orthopedically handicapped | 12,182 | |
| Number on Register, December 31, 1955 | | 36,157 |
| Number of orthopedically handicapped | 21,762 | |
| Number of non-orthopedically handicapped | 14,395 | |

In December, 1954 the Director of the Division of Maternal and Child Health Services, with the approval of the Commissioner, appointed a committee to study the needs of crippled children in the State. The report of the committee, submitted on May 12, 1956, contained general information and tables showing the work and growth of the Crippled Children's Program during 1949 through 1954, a statement of diagnostic categories not served by Services for Crippled Children, and a summary of those additional categories which the districts reported should be covered. The report showed the very considerable volume of work being done by district personnel as part of these services. The report included recommendations for immediate improvement of the program and for long-range planning for improved services.

## Statistical Services

The statistical section of the Division collected and analyzed statistics on the various aspects of the maternal and child health and crippled children's programs. These statistics have been of value not only to the staff of the Division but also to other members of the Department and to research workers studying the problems of the mother and the child.

## Legislation

During this seven-year period, laws were passed covering the following phases of maternal and child health and crippled children's services.

### *Maternity*

| | |
|---|---|
| Chapter 113 (1950) | Premarital Blood Test |
| Chapter 232 (1954) | Paternity via Blood-Grouping Tests |
| Chapter 449 (1955) | Hospitals to Determine Blood Type of Certain Patients |

### *Infant*

| | |
|---|---|
| Chapter 72 (1952) | Recording of Birth Certificate in Town of Residence if Infant is Born out of State or out of U. S. |
| Chapter 753 (1955) | Prematurely-born Infants (Amendment to Chapter 601 (1949).) |

### *Preschool*

| | |
|---|---|
| Chapter 205 (1950) | Child Care Centers and Day Care Centers |
| Chapter 673 (1951) | Assistance for Blind Children |
| Chapter 492 (1952) | Care at Lakeville State Sanatorium for Children with Arthritis |

### *School Age Child*

| | |
|---|---|
| Chapter 89 (1951) | Infectious Diseases in Children |
| Chapter 342 (1952) | Expenses of T & A Operations Paid by Local Welfare Departments to Be Reimbursed by State Department of Public Welfare |
| Chapter 304 (1953) | Use of School Buses for Transportation to Certain Educational or Recreational Projects |
| Chapter 352 (1953) | Transportation of School Children with Cerebral Palsy |
| Chapter 383 (1953) | Care of Children with Muscular Dystrophy at Lakeville State Sanatorium |
| Chapter 508 (1954) | Transferring the Massachusetts Hospital School and Hospital for State Minor Wards to the Department of Public Health |
| Chapter 514 (1954) | Instruction for Mentally Retarded |
| Chapter 113 (1955) | Employment under 16 Years of Age |

## Special Projects

Several new projects were introduced during this period. They included the Greater New Bedford Children's Accident Prevention Program, Poison Information Center, Special Project for Providing Intensive Medical Care to Women with Abnormal Carbohydrate Metabolism in Pregnancy, and Epilepsy Training Program. Support was afforded all of them save the first-mentioned by means of funds from the Children's Bureau for special projects.

*Greater New Bedford Children's Accident Prevention Program* — This program involved not only provision of service but also study of methods of community cooperation between public and private agencies in establishing a program to prevent childhood accidents at home, at school, and elsewhere in the child's environment.

Its objective was to demonstrate the value of such a specific program for prevention of accidents to children. It was carried on for four years, and supported in part by the Charles H. Hood Dairy Foundation.

*Poison Information Center* — In cooperation with the Children's Medical Center, the Boston Floating Hospital, the Boston City Hospital, the New England Chapter of the American Academy of Pediatrics, the Massachusetts College of Pharmacy, and the Department of Legal Medicine of Harvard Medical School, a program was established to assist physicians in the care of their child patients who have been poisoned. Material concerning the incidence of poisoning among children, the types of poisons involved, and the most effective treatment for each type of poisoning has been made available to physicians throughout the Commonwealth. A Poison Information Center was established in the Children's Medical Center, from which physicians receive information concerning the ingredients of potentially poisonous compounds commonly ingested by children and the current method of treating these patients if the compound contains a poisonous substance.

*Medical Care for Pregnant Women* — This project was established to provide intensive and comprehensive medical care, including dietary therapy and insulin where necessary, for pregnant women having abnormal carbohydrate metabolism. It was carried out at the Boston City Hospital and the Boston Lying-in Hospital. The principal objectives were to prevent fetal wastage, certain complications of pregnancy, and maternal deaths; to decrease the chance of diabetes occurring in infants born to mothers with abnormal carbohydrate metabolism during pregnancy, and hopefully to delay the onset of diabetes in later life in women who demonstrated abnormal carbohydrate metabolism during pregnancy.

*Epilepsy Program* — An epilepsy training program was established through the Seizure Unit, Children's Medical Center, for physicians and technicians. It has been estimated that at least one of every 200 persons suffers from epilepsy. The number of physicians especially qualified to treat epilepsy is relatively small. Also, there is a dearth of technicians qualified to make electroencephalogram tracings. Dr. William G. Lennox is in charge of this program. The training course for physicians and technicians is for a period of one to three months and includes both didactic and clinical training. In 1952, 10 physicians and 11 technicians were trained; in 1954, the number was seven physicians and 13 technicians.

*Training in Maternal and Child Health* — Financial support was continued for courses in maternal and child health services and in administration of maternal and child health programs at the Harvard School of Public Health. During the year 1955–1956, 18 students in the basic course in maternal and child health came under this program and there were an additional eight students in the course on administration. During these years, modifications and adaptations of this program have been made as experience has shown them to be necessary. There has been an expansion of the staff, a broadening of facilities available for field observation and studies, and an intensification of teaching of students who are majoring in maternal and child health services. There has been increasing use of case material from clinical and public health resources, for example the family clinic. In addition, one fellowship in maternal and child health services was given annually to a qualified physician at the Harvard School of Public Health.

*Other Training Programs* — The maternity and pediatric nursing courses were continued at Boston University, and scholarships in pediatric nursing were given through the Boston University School of Nursing in cooperation with the Children's Medical Center. In 1948, the Medical Social Work Training Project was established in cooperation with the three schools of social work in Boston: Simmons College, Boston University, and Boston College. The Medical Social Work Faculty at the Harvard School of Public Health has also cooperated in this project. Through this course, 20 students have received this special training. During these years, fellowships in rheumatic fever and in pediatric cardiology were provided in cooperation with the Children's Medical Center, the House of the Good Samaritan, and the Harvard Medical School.

## Publications

During this period, ten publications were made by this Division.

# BUREAU OF PREVENTIVE DISEASE CONTROL

## DIVISION OF CANCER AND CHRONIC DISEASE

The activities that constitute public health programs vary according to time and place. In some parts of the world sanitation of the environment must still have the most important role, while in many health departments a major part of the time is even now devoted to the control of communicable disease. In areas such as Massachusetts, emphasis is being placed more and more on the control of chronic disease. The reasons for this change are obvious. The population is growing older. In 1850, 6.2 per cent of the Massachusetts population was 60 years of age or over. Half a century later the percentage was 8.0; in 1930 it had reached 14.6, and an estimate of the present percentage is 16.0 per cent. The causes of death have changed markedly. At the turn of the century, diabetes, apoplexy, heart disease, cancer, and nephritis accounted for slightly less than 20 per cent of all deaths, while at the present time these conditions account for about 70 per cent of all deaths.

A complete chronic disease control program is a blending of administration, service, and epidemiology. The weight given to the component parts may vary from state to state, but these parts are still present to some degree in all programs. Massachusetts allots great weight to epidemiology. Here, the possible relationship of the various sites of cancer to such factors as heredity, habits of living, occupation, and other environmental hazards are studied with the objective of adding to the sum total of knowledge regarding these diseases.

The epidemiological work done by the Division has been recognized by the Rockefeller Foundation, the Commonwealth Fund, the American Cancer Society, and the Public Health Service, all of which have given special grants over the years for this type of work.

The work of the Division of Cancer and Chronic Disease is divided into four component parts: cancer control, heart disease control, control of other chronic diseases, and an incipient geriatric program.

### Thirtieth Anniversary

In the spring of 1956, the Division celebrated the 30th anniversary of the Massachusetts Cancer Program. Thirteen clinics prepared special programs for this occasion, either in the form of a teaching clinic or a cured cancer clinic. The Division published a booklet highlighting important events over the period:

1926 — An Act to Promote the Prevention and Cure of Cancer and the Extension of Resources for Its Cure and Treatment — approved May 29, 1926.

The first cancer clinic opened in Newton, December 17, 1926.

Tumor Diagnosis Service integrated into the Massachusetts Cancer Program.

1927 — The following cancer clinics opened during the year:

| | |
|---|---|
| Lowell | Pondville |
| Lynn | Springfield |
| Worcester | |

Pondville Hospital opened — capacity 90 beds.

1928 — The following cancer clinics opened during the year:

| | |
|---|---|
| Berkshire County | Franklin County |
| Boston Dispensary | Lawrence |
| Fitchburg | New Bedford |

First annual meeting of the cancer clinic chiefs and the social workers.

1929 — Three-day graduate course in cancer for physicians. Division of Adult Hygiene established. (Changed to Division of Cancer and Other Chronic Diseases in 1945, and to Division of Cancer and Chronic Disease in 1955.)

1930 — Brockton Cancer Clinic opened.

1932 — First Cured Cancer Clinic.
Achievement Week.

1933 — The book *Cancer and Other Chronic Diseases* was published. This was the culmination of a four-year study of the chronic disease problem in Massachusetts.

1935 — Cooperative Cancer Control Committees were first organized. (This activity continued until 1948.)

1935 — Pondville Hospital enlarged — capacity 147 beds.
The following cancer clinics opened during the year:

| | |
|---|---|
| Beth Israel | Greenfield |
| Gardner | Newburyport (discon. in 1942) |
| Gloucester | North Adams |

Northampton (discontinued in 1939)

1936 — Cape Cod Cancer Clinic opened (discontinued in 1947).

1937 — Monsignor Roche House for cancer opened at the Westfield State Sanatorium.
Fall River Cancer Clinic opened.
Westfield Cancer Clinic opened.

1938 — Salem Cancer Clinic opened.

1939 — Beverly Cancer Clinic opened.
Quincy Cancer Clinic opened.

1940 — *Cancer, A Manual for Practitioners*, first edition, was distributed to every practicing physician in Massachusetts. (A second edition was distributed in 1950, and a third in 1956.)

1944 — Cancer education was introduced into the Massachusetts schools.

1948 — The American Cancer Society, Massachusetts Division, Incorporated, assumed the major part of the responsibility for cancer education of the laity.

1954 — The George H. Bigelow Building opened at Pondville Hospital.
The Mount Auburn Hospital Cancer Clinic opened.

1955 — The following cancer clinics opened during the year:
Cambridge City Hospital
Free Hospital for Women
Massachusetts Memorial Hospitals

1956 — Boston City Hospital Cancer Clinic opened.

## Epidemiology and Biometrics

*Cancer of the Lung*

The major epidemiological activity of the Division of Cancer and Chronic Disease dealt with cancer of the lung. The Division, in conjunction with Dr. Leonid S. Snegireff of the Cancer Control Unit, Harvard School of Public Health, has been studying this problem since 1950.

A first report on this study was published in *Cancer*, July–August, 1956. The final report will be published as a Harvard Monograph.

The major findings are as follows:

1. The disease is increasing at a far greater rate than any other form of cancer.
2. The total adjusted rate for males is increasing faster than that for the females, but in the older age groups the difference is not significant.
3. An excessive amount of lung cancer has been observed in some occupational groups, and it is probable that a certain percentage of the cases are related

to occupation. However, our lung cancer data, which included all occupations throughout the lifetime of the individual, did not furnish proof that occupation was of major importance.

4. Individuals with chronic and/or frequent respiratory conditions appeared to have more lung cancer than the remainder of the population.
5. Individuals whose work was wholly outdoors had a higher rate than those whose work was partially outdoors. This latter group, in turn, had a higher rate than those individuals who worked wholly indoors.
6. Individuals using an excessive amount of alcohol had higher rates than those who did not.
7. There appeared to be slightly more lung cancer among city dwellers than among those living in the country, but the data did not show consistency. The combined counties of Barnstable, Dukes, and Nantucket had a higher adjusted rate than the cities of Springfield and Worcester, but the combined counties were slightly lower than Boston.
8. Cigarette smoking was found to be the most outstanding variable in the study. The lifetime cigarette smoking habits of individuals with lung cancer and of the controls were estimated and computations made on the basis of the number of years the individual smoked 1 package of cigarettes per day (for example, the individual smoking 3 packages of cigarettes per day for one year would be considered equivalent to an individual smoking 1 package of cigarettes per day for three years). It was found that there was very little lung cancer among individuals smoking the equivalent of 1 package of cigarettes per day up to 20 years. However, the increase became rapid after 25 years and the individual who had smoked the equivalent of 1 package of cigarettes per day for 55 years or more had 10 times as much lung cancer as those individuals smoking 1 package of cigarettes per day for less than 25 years and about 30 times more than those who never smoked. Very few women were found who had smoked the equivalent of 1 package of cigarettes per day for as long as 25 years.

*Health Protection Clinic Demonstration*

The health protection clinics demonstration was one effort to evaluate more screening to detect chronic disease. Between December 1, 1949 and June 30, 1952, over 9000 people were screened. An extensive history was taken; hemoglobin, blood sugar analysis, visual test, hearing test, x-ray of the chest, height and weight, blood pressure, and physical examination were offered throughout the demonstration. In the latter part of the demonstration, electrocardiograms and vaginal smears were done routinely. Since a screening cannot be expected to detect every diagnosable condition, the findings in the study were satisfactory. The demonstration revealed that such a screening program was too costly and indicated that some of the tests should be omitted in a service program.

Three papers were published regarding this project: "The Evaluation of a Pilot Clinic," *New England Journal of Medicine*, September 25, 1952; "The Cost and Evaluation of Multiple Screening," *New York State Journal of Medicine*, November 1, 1952; "Multiphasic Screening; What is It? What are the Advantages?" *Transactions* of the 58th Annual Meeting of the National Tuberculosis Association, May, 1952.

*Cancer Detection Center*

An evaluation of a cancer detection center was made, supported in part by a grant from the Public Health Service. Among the conclusions drawn were the following:

The small number of cancers found among asymptomatic subjects would have been greatly increased if applicants with symptoms had been accepted by the Center.

The place for examination of persons with symptoms is the private physician's office or a cancer diagnostic clinic, rather than a detection center.

The few cancers found among asymptomatic persons, as well as the high cost of each examination, precludes large-scale financing of cancer detection centers by either governmental or voluntary agencies.

Many of the procedures carried out at the detection center probably could be done by the general practitioner if proper instruments were available to him at a reasonable cost and if he were willing to spend sufficient time in taking a history and making an examination.

A report of this demonstration was published in the *New England Journal of Medicine*, November 2, 1951.

*Cancer of the Buccal Cavity*

A study of the etiology of cancer of the mouth is being conducted by the Division and by Dr. Harry Harding, consultant dentist at the Pondville Hospital. A thorough oral examination is made on all patients and a careful epidemiological history is taken to uncover possible causative factors.

*Diabetes Self-Testing Study*

A study was carried out in Gloucester to determine the extent to which a community would participate in self-testing of urine as a diabetic control measure. The study was under the joint sponsorship of the Medical Staff of the Addison Gilbert Hospital, the Massachusetts Department of Public Health, and the Public Health Service. The study showed that a community will participate in a self-testing program where there is concerted action on the part of local groups. However, 41 per cent of those who obtained the kit free of charge failed to use it, and many others whose tests had been positive failed to consult a physician regarding their condition.

This study was reported in *Diabetes*, the Journal of the American Diabetes Association, May, 1952.

*Cancer of the Uterus*

In 1950, the result of the study of cervical cancer was published in *Cancer*, November, 1950. This showed that early marriage, early termination of pregnancies, and divorce or separation remained significantly associated with cancer of the cervix. When cancer of the cervix cases were studied in relation to histological classification, the important variables were found to be related to the epidermoid type, and not to the adenocarcinoma group. Cancer in situ, however, showed relationship with early marriage and divorce. These findings were published in booklet form, *The Laboratory Diagnosis of Cancer of the Cervix*, edited by Homburger and Fishman.

*Cytology Study*

The findings in the cytology study were published in 1950. The incidence of cancer among individuals with no gynecological symptoms was less than 1 per cent. Cancer of the uterus was found in about 30 per cent of individuals with bleeding as a symptom, in about 5 per cent among those with vaginal discharge, and in about 3 per cent of those with other gynecological symptoms.

This study was reported in the *New England Journal of Medicine*, April 3, 1952.

*The Chronic Disease Survey in the Brookfields*

The chronic disease survey, conducted in the four Brookfields, included questions regarding heredity, occupation, living conditions, habits, and chronic diseases. The personnel were furnished by the Division, while the traveling expenses were supplied by Harvard University, utilizing a special grant for this purpose from the American Cancer Society. That part of the data pertinent to the incidence of chronic disease was reported by Lombard and Quinn in *Commonhealth;* that part regarding heredity, occupations, living conditions, and habits is to be utilized in the rural control phase of the lung cancer study.

*Evaluation of Cancer Education*

The results of two evaluation studies on cancer education were reported during this period, one in the *Massachusetts Health Journal*, May, 1950 and the other in the *Bulletin of Cancer Control*, July, 1954. These studies furnished an estimate of

the public's knowledge of the public health aspects of cancer, and the later one gave some indication of improvement that had taken place in the city of Waltham.

*Cancer of the Prostate*

An article on "Epidemiology of Cancer of the Prostate" was prepared and published in a monograph, *The Laboratory Diagnosis of Cancer of the Prostate*, Homburger and Fishman. This included a review of the literature on the subject and end results from the Massachusetts Cancer Clinics, which showed a great improvement in five-year survivals during recent years.

*Epidemiological Consultation*

All research papers prepared by Pondville and Westfield physicians which contain statistics are reviewed by this Division to determine the statistical soundness of the conclusions. In addition, many physicians throughout the State are requesting that papers prepared by them be verified statistically.

*Statistical Articles*

Inasmuch as from statistical studies the Massachusetts Cancer Program received its inspiration, determined its scope, evaluated its activities, changed its policies, and obtained new ideas for cancer control, the Director of this program has been asked on many occasions to discuss this subject.

In 1953, the book *Physiopathology of Cancer* by Homburger and Fishman, was published. One chapter in this book, "Statistical Studies in Cancer," was written by the Director. A paper on statistics in the cancer program was published in 1952 in the *Harvard Public Health Alumni Bulletin*. Two articles appeared in the proceedings of the Second National Cancer Conference, 1952, published by the American Cancer Society, and a review of the statistical work of the Division appeared in *Public Health Reports*, published by the United States Department of Health, Education, and Welfare ("Twenty-six Years of Cancer Control," July, 1953).

## Services

*Cancer Clinics*

The cancer clinics have had phenomenal growth within the past six years. Due to the efforts of Representative Rico Matera, additional funds were obtained which enabled the Division to open new clinics and reactivate others. As of July, 1956 there were 25 State-aided cancer clinics and two State cancer clinics. In 1955, the unit payment values were changed in order that services offered in State-aided cancer clinics might be extended and improved. During the six years represented by this report 27,756 new patients attended the cancer clinics. An average of over 24,000 patients made return visits to the clinic each year.

Traditionally, the clinics furnish group diagnosis for any individual in Massachusetts who is suspected of having a cancerous or precancerous condition. Approximately 85 per cent of patients attending the clinics are referred by practicing physicians who utilize the diagnostic facilities of the clinics to confirm their own diagnoses.

*Tumor Diagnosis Service*

A tumor diagnosis service is maintained by the Department of Public Health in conjunction with the Cancer Commission of Harvard University. Any physician or hospital may have suspicious tissue examined pathologically to determine the presence or absence of cancer. This service is used by physicians, many of whom have no other pathological service available, and by pathologists who confirm diagnoses in borderline cases.

In 1945, approximately 4000 specimens were examined, and from that time to the present there has been a phenomenal increase in the use of this service until at the present time, over 13,000 specimens are being examined annually.

## Education

*Professional*

*Physicians* — Cancer education of physicians is accomplished largely through teaching clinics. Physicians who would find it difficult to travel to Boston can easily arrange to spend a few hours attending a local clinic. In practice, the doctor might

see one or two cases in the course of a year, whereas the clinic provides an additional opportunity to see a wide variety of cases and to follow the newer trends in diagnosis and treatment.

In the six-year period, 143 teaching clinics were held, with an average physician attendance of 35.

The second edition of *Cancer, A Manual for Practitioners* was distributed to all practicing physicians in the Commonwealth in 1950, and the third edition in 1956. The following are quotations from the preface of the second and third editions:

"This second edition has been prepared in answer to the continuing demand. The advance in the knowledge of cancer and its treatment has made many sections of the first edition incomplete."

"Cancer detection and therapy have changed significantly in the six years. In this third edition all of the chapters have been revised and several new chapters have been added. This manual has been designed primarily to aid practitioners in the early diagnosis of cancer. It is anticipated that students will find the third edition as useful an educational tool as others have found the previous editions. The accepted methods of treatment have been described, but no attempt has been made to go into details."

A chapter on "The Epidemiological Aspects of Cancer" and a second chapter on "The Cancer Control Program of the Massachusetts Department of Public Health" were included in this volume.

*Nurses* — Several nurses' institutes have been held. These institutes consist of a concentrated two-week period of instruction and observation at Pondville Hospital, the State-aided cancer clinics, and various institutions. The course includes discussion of the various sites of cancer from the surgical, pathological, radiological, and nursing points of view, and seminars on the public health aspects of cancer control. The number of nurses who may attend the institute is limited in order that each nurse may be given individual attention.

*Workers in Biometrics* — Due to the scarcity of women trained in biometric procedures, it has been necessary to furnish in-service training. Several courses in biometrics have been given during the six-year period. In two of the courses personnel from the Massachusetts General and the Massachusetts Memorial Hospitals requested permission to attend.

*Lay Education*

Since 1948, lay education in cancer control has been largely the responsibility of the Massachusetts Division of the American Cancer Society. During the past six years, the Division furnished some pamphlets and provided speakers; in addition, a considerable amount of time was devoted to the evaluation of lay education.

*Visitors*

During recent years representatives from 26 foreign countries and from 41 states and territories requested information regarding the cancer program. Many visited the Division, others wrote for information.

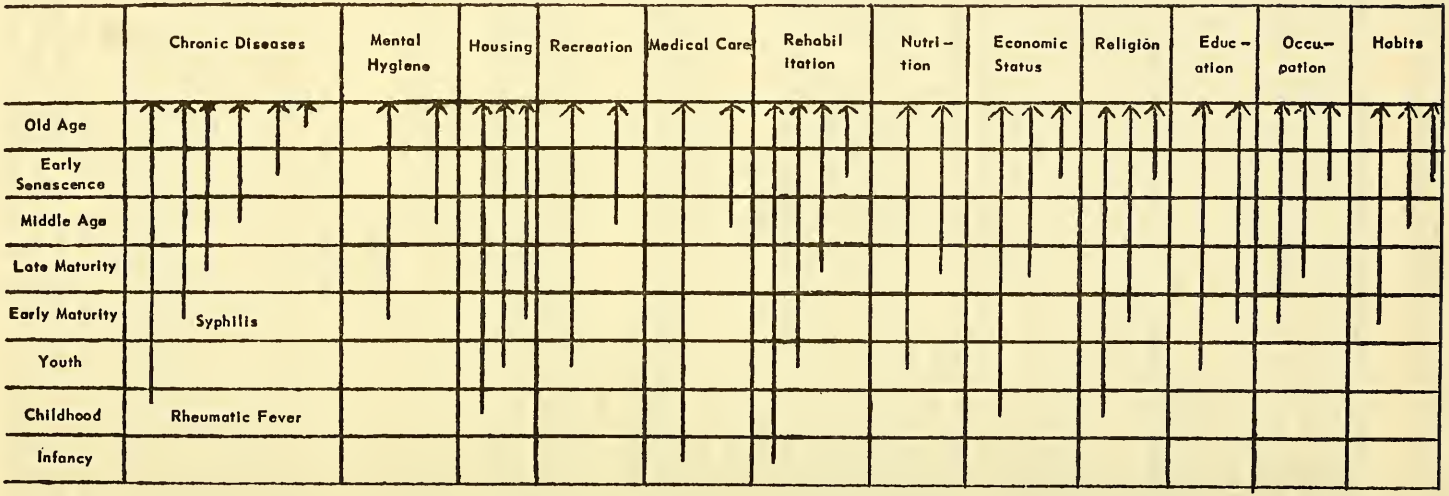
## Registration

At the inception of the Massachusetts Cancer Program the policy was adopted that all cancer cases should be followed until death. For 30 years the follow-up of patients has been continuing, and at the present time some of the first-year patients are still living. The percentage of lost cases is extremely low, being in the neighborhood of 2 per cent. This system forms the basis for many of the Division's studies.

Certain sites of cancer have far more cases of cancer than do other sites. It has been possible, therefore, to study extensively the end results of treatment for certain sites, but it has been impossible to study some sites due to the sparsity of cases.

On the national level, the difficulties of determining satisfactory end results are great. Variations in geographical location, classification, selection of cases, and methods of therapy have made it impossible to obtain uniform and comparable end results. The Public Health Service has requested those registries in the United

Diagrammatic Outline of Geriatric Study



States which are reasonably satisfactory to pool their data so that studies can be made that have a national significance, and enough cases to study the rare tumors. The Massachusetts Registry was invited to participate in this endeavor.

## Heart Program

The cardiac program as it functions in Massachusetts has stressed services to prevent progression of disease processes and cardiac invalidism, education of professional personnel to stimulate early case finding and improved patient care, rehabilitation services for cardiacs, and epidemiological research.

During the period, vital statistics data were studied to determine the magnitude of the cardiovascular disease problem in Massachusetts. Approximately 58 per cent of all deaths in Massachusetts were attributed to the cardiovascular diseases.

Funds are supplied for six medical social workers who assist patients in carrying out physicians' advice. For the individual with a chronic illness, social and economic problems are greatly magnified, and their solution may often constitute an essential part of the prescribed treatment plan.

### *Cardiac Work Classification Unit*

A pilot Cardiac Work Classification Unit functions under the combined auspices of the Bay State Medical Rehabilitation Clinic, the Massachusetts Department of Public Health, and the Massachusetts Heart Association. The clinic has functioned for four years at the Boston Bay State Rehabilitation Center. The cardiac unit provides a consultation service in cardiac diagnosis and in classification of individuals relative to their capacities for employment, for private physicians, hospitals, clinics, industries, and other social agencies.

### *Research*

*Boston Dispensary* — Records have been collected for a study of rehabilitation of individuals with heart disease. This important research project demonstrates utilization of maximum rehabilitation services for cardiac patients.

*Boston Lying-in Project* — A combined service and research program is being given to the Boston Lying-in Hospital to study the effects of heart disease in pregnancy. The provision of supportive services and greater utilization of community resources augment the armamentarium of the cardiologist in preventing cardiac disability associated with the stresses of pregnancy.

Instruction in adapting work-simplification methods to household tasks enables the pregnant cardiac to save 75 per cent of the energy expended, and further aids in the maintenance of cardiac reserve.

*Psychological and Social Consequences of Heart Disease* — A preliminary study dealing with the social and psychological consequences of heart disease is being conducted in cooperation with the Public Health Service. This is an attempt to determine the effect of social situations, of family, of finances, and of employment on the cardiac.

*Lawrence General Hospital Cardiac Clinic* — At the Lawrence General Hospital Cardiac Clinic a study is being conducted to demonstrate the value of a cardiac team which is composed of a cardiologist, social worker, public health nurse, and nutritionist. The members of this team are present at each clinic session and each case is reviewed and evaluated by group discussion and participation. In addition to working with the patient in the clinic, care will be extended into the home by each of the team members.

### *Professional Education*

*Physicians* — Information is furnished to physicians on new discoveries in heart disease, through a bulletin sent to all physicians requesting it. The Department cooperates with the Massachusetts Medical Society in furnishing postgraduate education.

*Nurses* — Recognizing the need for professional education for nurses in all fields relating to the newer concepts of patient care in cardiovascular disease, the Cancer and Chronic Disease Division undertook to develop such a program. Participants

in the program included physicians, social workers, nutritionists, and nurses. Courses have been completed in the following locations in the state: Andover, Cambridge, Fitchburg, Lakeville, Lawrence, Lowell, Northampton, Pittsfield, Quincy, Salem, Waltham, and Worcester. These courses were from six to eight weeks in duration and the average attendance at a given session was 46. The total number who registered was 892 and there were several who attended who failed to register.

## Geriatric Program

Tentative plans for the geriatric program are as follows:

*Establishing of a Teaching Clinic for Prospective Workers in Geriatrics* — The care of the geriatric patient differs markedly from that of the ordinary patient. Most physicians and nurses are unfamiliar with the best methods for handling this type of patient. The present-day physician is geared to combat the individual disease, and it is necessary for him to learn new techniques in order to give the best care to the geriatric patient. Here, emphasis is placed on the over-all welfare of the patient rather than any one disease entity. Recreation, work, and nutrition may be as important as medication. The geriatric clinic must conduct research into the best way of caring for the aging sick, utilizing mental hygiene, physiotherapy, rehabilitation, and some medicine. The teaching geriatric clinic will train physicians, nurses, and ancillary personnel in the best methods of conducting such clinics.

*Service Geriatric Clinics* — Several geriatric clinics will be organized as soon as the necessary arrangements can be made and staffs trained to conduct them. It is expected that these clinics will, in turn, use their facilities to demonstrate to the profession the best method of handling the problems of this old-age group.

*Research* — The aged person is the sum total of all his previous experiences. For example, it is believed that some of the chronic diseases have their origin in occurrences years before the disease manifests itself; heart disease may follow rheumatic fever or syphilis; hypertension appears to be inherited; certain forms of cancer appear to be associated with poverty; lung cancer may follow prolonged years of cigarette smoking, and heart disease may also be related to smoking. Not only do the chronic diseases have their origin in earlier life, but the other facets which comprise the geriatric problem also begin before senescence.

The accompanying diagram shows the likely time of origin. However, the exact time of onset of many of the contributing factors is, of course, unknown and it will require extensive research to complete such a diagram accurately. A long-term study of geriatric patients in the clinics, perhaps supplemented by studies made in nursing homes as well as homes for the aged, is anticipated. The non-directive technique of interviewing should be employed and calls should be frequent so that the patient would talk freely. It is believed that sufficient information will be obtained regarding the time of onset of some of the factors inherent in many of the aged to enable the establishment of prevention programs for at least some of the problems of old age.

## In Memoriam

### CHANNING C. SIMMONS, M.D.

Died August 15, 1953

Dr. Simmons had been an active supporter of the cancer program since its inception in 1926. During the war years, he served as Assistant Director. He edited the two editions of the book *Cancer, A Manual for Practitioners*, and made a survey of the State-aided cancer clinics. For many years he served on the Cancer Advisory Committee, at first as a member and later as Chairman. After he terminated his official connection with the Department, he frequently visited at the Division office since his advice was sought on many occasions.

### IRA T. NATHANSON, M.D.

Died May 3, 1954

Cancer lost one of its foremost workers and the Division of Cancer and Chronic Disease lost a good friend when Dr. Ira T. Nathanson passed away. From his early days at Pondville Hospital to the time of his death, he kept in close contact with the Division.

# STATISTICAL REPORT

January 1, 1950 to December 31, 1955

TABLE I — *Cancer Death Rates in Massachusetts*
(Rates per 100,000)

| Year | Crude Rate | | Adjusted Rate* | |
|---|---|---|---|---|
| | Male | Female | Male | Female |
| 1925–1929 | 109.9 | 149.8 | 150.8 | 205.7 |
| 1930–1934 | 127.3 | 159.9 | 162.8 | 204.9 |
| 1935–1939 | 146.0 | 169.1 | 170.3 | 199.2 |
| 1940–1944 | 163.9 | 178.9 | 178.3 | 195.2 |
| 1945–1949 | 180.9 | 181.7 | 186.0 | 187.4 |
| 1950–1954 | 198.2 | 184.1 | 196.6 | 184.5 |

*Adjusted — Massachusetts population, 1950.

TABLE II — *Ratio of Cancer Deaths to Total Deaths in Massachusetts*

| Age | Males | | | | | | Females | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1925 | 1930 | 1935 | 1940 | 1945 | 1950 | 1925 | 1930 | 1935 | 1940 | 1945 | 1950 |
| All Ages | 8.1 | 9.9 | 10.9 | 12.5 | 13.9 | 15.4 | 12.2 | 13.7 | 15.0 | 16.5 | 17.2 | 18.0 |
| 30–39 | 4.3 | 4.5 | 4.8 | 6.9 | 8.7 | 11.3 | 9.6 | 11.0 | 11.9 | 17.8 | 16.6 | 24.9 |
| 40–49 | 7.7 | 8.4 | 9.8 | 10.6 | 11.1 | 14.3 | 21.6 | 22.0 | 22.7 | 27.7 | 28.7 | 34.4 |
| 50–59 | 13.0 | 14.2 | 13.8 | 15.3 | 15.4 | 18.1 | 23.5 | 25.2 | 24.7 | 27.2 | 29.4 | 32.0 |
| 60–69 | 14.7 | 15.8 | 15.1 | 16.1 | 18.0 | 19.0 | 19.0 | 19.0 | 20.8 | 21.7 | 22.5 | 23.3 |
| 70–79 | 11.5 | 13.4 | 14.6 | 14.8 | 16.7 | 17.0 | 13.2 | 14.3 | 14.8 | 15.2 | 16.0 | 16.4 |
| 80+ | 7.0 | 7.4 | 7.7 | 9.2 | 11.5 | 11.6 | 7.2 | 8.1 | 7.8 | 8.6 | 8.9 | 9.4 |

TABLE III — *Volume of Clinic Attendance and Specimens at the Tumor Diagnosis Service*

| | 1940 | 1950 | 1951 | 1952 | 1953 | 1954 | 1955 |
|---|---|---|---|---|---|---|---|
| Total Number of Patients at Cancer Clinics | 24,264 | 27,623 | 26,658 | 27,275 | 28,257 | 29,882 | 32,525 |
| Percentage of Cancer Patients Attending Clinics Referred by Physicians | 86.4 | 86.3 | 83.9 | 85.1 | 84.8 | 85.3 | 84.6 |
| Number of Specimens Examined by Tumor Diagnosis Services | 3,907 | 9,862 | 9,720 | 10,110 | 10,145 | 11,570 | 12,301 |
| Number of Doctors Using Tumor Diagnosis Service | 798 | 1,218 | 1,133 | 1,125 | 1,233 | 1,227 | 1,323 |

TABLE IV — *Attendance of New Patients at Cancer Clinics*

| | | Number of Individuals | Attendance All Clinics | Total Diagnosis |
|---|---|---|---|---|
| New Cancers Diagnosed at Clinic | 1950 | 1618 | 1708 | 1693 |
| | 1951 | 1469 | 1548 | 1545 |
| | 1952 | 1602 | 1678 | 1700 |
| | 1953 | 1719 | 1719 | 1753 |
| | 1954 | 1648 | 1720 | 1772 |
| | 1955 | 1762 | 1843 | 1893 |
| Check-ups Following Treatment for Cancer Elsewhere —no Evidence of Cancer at Time of Clinic Visit | 1950 | 165 | 169 | 178 |
| | 1951 | 195 | 207 | 204 |
| | 1952 | 189 | 196 | 209 |
| | 1953 | 196 | 196 | 203 |
| | 1954 | 167 | 183 | 194 |
| | 1955 | 574 | 580 | 615 |
| Non-Cancer Diagnosis | 1950 | 2974 | 3021 | 2987 |
| | 1951 | 2807 | 2857 | 2829 |
| | 1952 | 2585 | 2636 | 2604 |
| | 1953 | 2763 | 2763 | 2743 |
| | 1954 | 2695 | 2732 | 2718 |
| | 1955 | 2758 | 2784 | 2773 |
| Totals | 1950 | 4747 | 4898 | 4858 |
| | 1951 | 4471 | 4612 | 4578 |
| | 1952 | 4376 | 4510 | 4513 |
| | 1953 | 4678 | 4678 | 4699 |
| | 1954 | 4510 | 4635 | 4684 |
| | 1955 | 5094 | 5207 | 5281 |

TABLE V — *Site of Cancers Diagnosed in Cancer Clinics*

| | Percentage of Cancer Patients With Cancer of Given Site | Percentage of Cancers of Given Site—That Were Primary | Percentage of Primary Cancers Given Site That Were Localized |
|---|---|---|---|
| Lip | 3.0 | 93.5 | 93.6 |
| Other Buccal | 6.3 | 90.1 | 44.6 |
| Stomach | 2.9 | 88.8 | 20.4 |
| Intestines | 3.8 | 79.7 | 42.2 |
| Rectum | 3.8 | 88.9 | 53.4 |
| Other Digestive | 1.7 | 94.6 | 54.3 |
| Respiratory | 6.9 | 91.1 | 38.4 |
| Breast | 11.8 | 78.3 | 39.3 |
| Female Genitals | 11.3 | 78.2 | 53.7 |
| Male Genitals | 2.2 | 80.8 | 54.2 |
| Urinary Organs | 2.2 | 76.0 | 59.6 |
| Skin | 34.1 | 95.2 | 97.8 |
| All Other Sites | 5.4 | 85.7 | 23.8 |
| Lymphomas | 4.6 | | |

## TABLE VI — *Site of Specimens Examined by the Tumor Diagnosis Service, 1955*

| Site | Percentage Malignant 1955 | Percentage Malignant 1950 | Percentage Distribution of Malignant Specimens 1955 | Percentage Distribution of Malignant Specimens 1950 | Percentage Distribution of Total Specimens 1955 | Percentage Distribution of Total Specimens 1950 |
|---|---|---|---|---|---|---|
| Buccal Cavity | 12.4 | 13.8 | 4.5 | 8.6 | 5.0 | 8.6 |
| Digestive System | 16.4 | 23.8 | 6.8 | 10.7 | 5.9 | 6.2 |
| Respiratory System | 13.7 | 25.0 | 0.9 | 0.9 | 0.9 | 0.5 |
| Breast | 16.8 | 19.9 | 2.1 | 5.4 | 1.7 | 3.7 |
| Female Genitals | 4.6 | 5.8 | 8.8 | 13.5 | 27.0 | 32.0 |
| Male Genitals | 11.4 | 15.4 | 0.5 | 0.9 | 0.6 | 0.8 |
| Skin | 19.2 | 16.4 | 71.4 | 53.4 | 52.1 | 44.5 |
| Urinary Organs | 32.5 | 23.3 | 0.8 | 1.1 | 0.3 | 0.6 |
| Others | 9.2 | 25.3 | 4.2 | 5.4 | 6.3 | 3.1 |

## TABLE VII — *Total Attendance at Individual State-Aided Cancer Clinics*

| Location | Hospital | 1950 | 1951 | 1952 | 1953 | 1954 | 1955 |
|---|---|---|---|---|---|---|---|
| Beverly | Beverly | 335 | 408 | 368 | 306 | 330 | 306 |
| Boston | Beth Israel | 1,530 | 1,517 | 1,500 | 1,421 | 1,185 | 1,135 |
| | Boston Dispensary | 2,176 | 1,923 | 1,697 | 1,411 | 1,379 | 1,277 |
| | Massachusetts Memorial | – | – | – | – | – | 287* |
| Brookline | Free Hospital for Women | – | – | – | – | – | 902* |
| Brockton | Brockton | 570 | 481 | 381 | 385 | 404 | 339 |
| Cambridge | Mt. Auburn | – | – | – | – | 10* | 283 |
| | Cambridge City | – | – | – | – | – | 82* |
| Fall River | Union | 1,080 | 1,006 | 757 | 818 | 825 | 1,203 |
| Fitchburg | Burbank | 148 | 160 | 182 | 195 | 238 | 267 |
| Gardner | Henry Heywood | 91 | 106 | 90 | 92 | 105 | 77 |
| Gloucester | Addison Gilbert | 80 | 103 | 77 | 108 | 81 | 89 |
| Greenfield | Franklin County | 74 | 57 | 46 | 35 | 35 | 37 |
| Lawrence | Lawrence General | 928 | 1,166 | 782 | 840 | 989 | 976 |
| Lowell | Lowell General | 281 | 371 | 257 | 278 | 246 | 227 |
| | St. John's | – | – | – | – | – | – |
| | St. Joseph's | – | – | – | – | – | – |
| Lynn | Lynn | 1,036 | 939 | 959 | 891 | 924 | 752 |
| New Bedford | St. Luke's | 883 | 691 | 586 | 721 | 633 | 556 |
| Newton | Newton-Wellesley | – | 25* | 319 | 344 | 244 | 230 |
| Norfolk | Pondville | 8,458 | 8,539 | 9,843 | 10,611 | 11,805 | 13,108 |
| North Adams | North Adams | 37 | 29 | 33 | 39 | 38 | 32 |
| Quincy | Quincy City | – | – | – | – | – | 16* |
| Salem | Salem | 411 | 408 | 385 | 340 | 381 | 363 |
| Springfield | Springfield | 452 | 490 | 422 | 506 | 494 | 453 |
| Westfield | Westfield Sanatorium | 7,783 | 7,274 | 7,631 | 8,048 | 8,550 | 8,576 |
| Worcester | Worcester Memorial | 1,411 | 1,106 | 1,108 | 994 | 1,129 | 952 |
| | St. Vincent's | – | – | – | – | – | – |

*Newly established — figures less than one year.

TABLE VIII — *Conditions Screened by Multiple Tests*
Rate per 100

| Disease | First Clinic | Second Clinic | Third Clinic | Fourth Clinic |
|---|---|---|---|---|
| Albuminuria | 4.2 | 3.0 | 3.9 | 0.6 |
| Anemia | 2.7 | 4.4 | 4.5 | 4.5 |
| Cancer — Lung | 0.3 | 0.0 | 0.0 | 0.0 |
| Cancer — Uterus (Papanicolaou) | 0.4 | 0.3 | 1.3 | 1.2 |
| Diabetes | 1.5 | 2.4 | 4.7 | 3.1 |
| Digestive System (Occult Blood) | 0.7 | 1.5 | 7.0 | 4.4 |
| Vision | 12.5 | 8.9 | 13.9 | 16.0 |
| Glycosuria | 12.8 | 4.8 | 2.8 | 2.4 |
| Healed Lesions (X-ray) | 1.3 | 4.8 | 3.4 | 1.4 |
| Hearing | 8.7 | 8.2 | 9.0 | 13.6 |
| Heart (X-ray, Electrocardiogram) | 1.8 | 4.4 | 11.4 | 11.7 |
| Hypertension | 12.4 | 14.3 | 14.3 | 17.5 |
| Other Conditions by X-ray | 0.0 | 0.04 | 0.1 | 1.0 |
| Other Respiratory | 0.9 | 1.6 | 2.4 | 3.1 |
| Overweight | 29.1 | 27.3 | 23.4 | 20.7 |
| Skeletal Abnormalities (X-ray) | 0.9 | 3.0 | 1.9 | 2.0 |
| Syphilis (Hinton Test) | 0.5 | 0.2 | 0.5 | 0.5 |
| Tuberculosis — Lungs (X-ray) | 0.8 | 0.2 | 0.9 | 2.6 |
| Underweight | 0.5 | 0.2 | 1.0 | 0.5 |

TABLE IX — *Survival of Cancer Patients, By Site, at Massachusetts Cancer Clinics*, 1927–1955

| Site | 5-Year Survival Rate | 10-Year Survival Rate | 15-Year Survival Rate | 20-Year Survival Rate | 25-Year Survival Rate |
|---|---|---|---|---|---|
| Breast | 36.6 | 22.7 | 16.3 | 11.4 | 8.3 |
| Stomach | 5.1 | 3.3 | 2.0 | 1.6 | 0.0 |
| Skin | 67.3 | 44.7 | 29.2 | 18.0 | 10.8 |
| Lung | 14.4 | 4.3 | 0.0 | 0.0 | 0.0 |
| Rectum | 17.4 | 12.2 | 7.1 | 3.6 | 2.4 |
| Uterus | 40.8 | 27.3 | 19.8 | 12.7 | 4.9 |
| Prostate | 19.7 | 4.8 | 2.9 | 0.0 | 0.0 |
| Cervix | 33.0 | 22.0 | 19.0 | 15.9 | 11.1 |
| Lip | 65.1 | 41.9 | 29.3 | 18.1 | 11.0 |
| Esophagus | 0.8 | 0.5 | 0.0 | 0.0 | 0.0 |
| Intestines | 21.1 | 13.6 | 9.6 | 6.3 | 4.7 |
| Leukemia | 10.4 | 4.4 | 3.3 | 1.6 | 0.0 |
| Buccal and Pharynx | 18.5 | 9.5 | 5.4 | 3.6 | 1.7 |
| Other Female Genitals | 11.7 | 7.6 | 5.0 | 3.9 | 3.1 |
| Larynx | 16.4 | 9.7 | 5.7 | 1.7 | 0.0 |
| Lymphomas | 24.9 | 14.4 | 9.4 | 6.1 | 0.0 |
| All Others | 17.1 | 12.7 | 9.8 | 7.6 | 6.1 |

CHART I

TEN LEADING CAUSES OF DEATH IN MASSACHUSETTS

1910 and 1954

Death Rates per 100,000

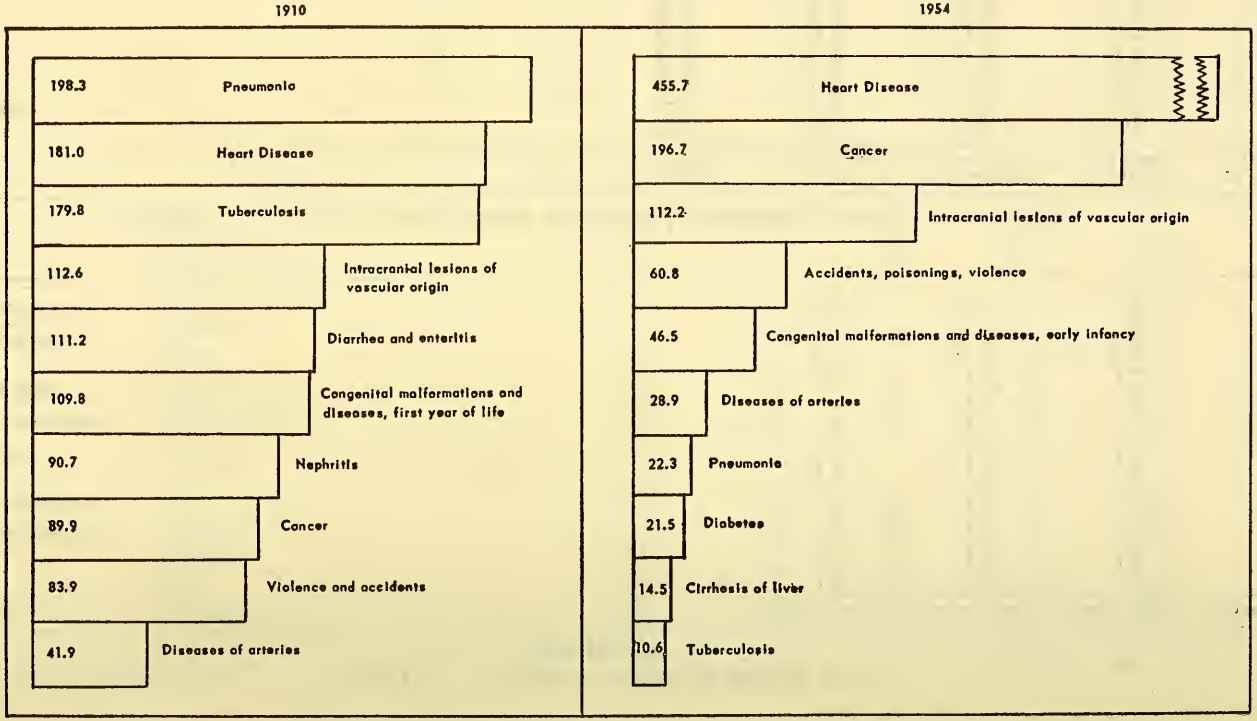


CHART 2

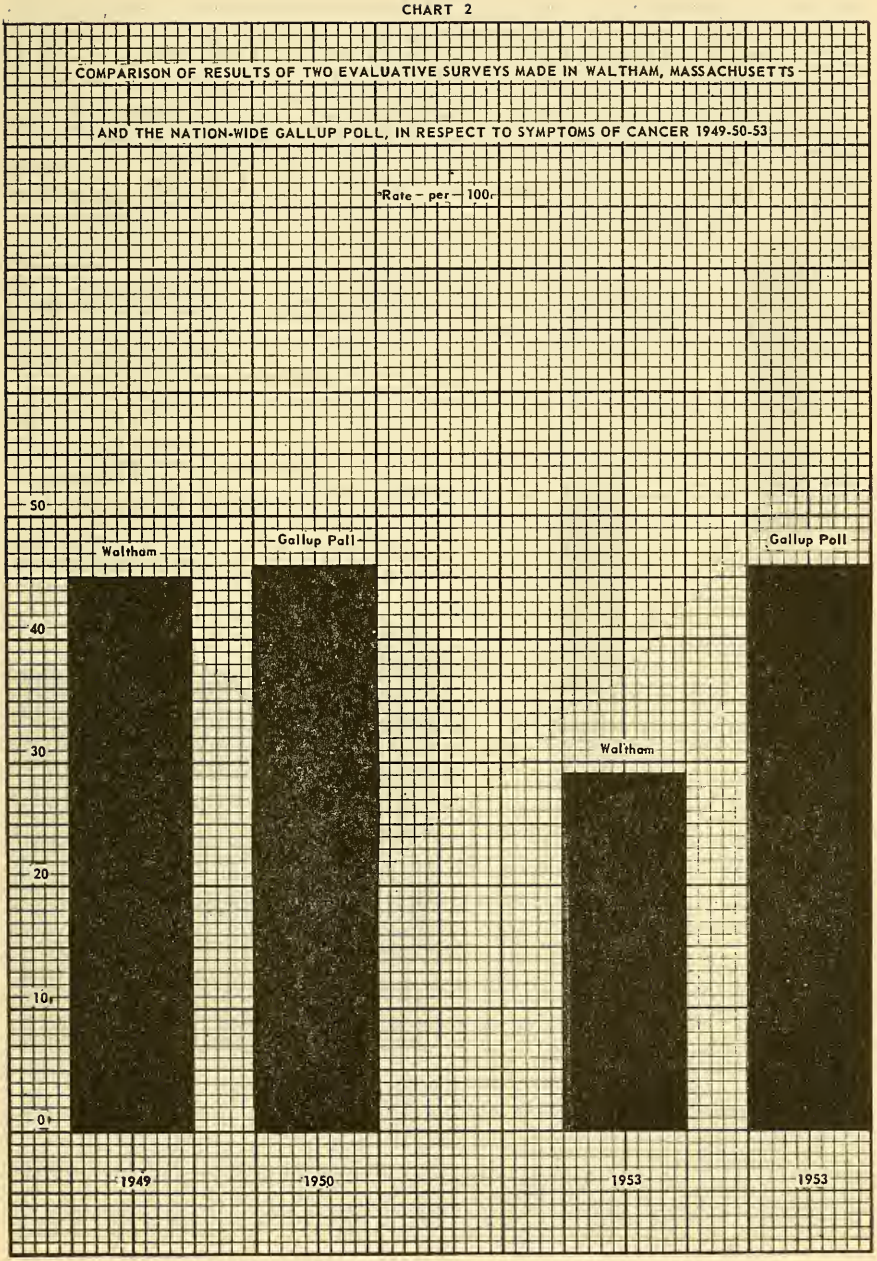

COMPARISON OF RESULTS OF TWO EVALUATIVE SURVEYS MADE IN WALTHAM, MASSACHUSETTS
AND THE NATION-WIDE GALLUP POLL, IN RESPECT TO SYMPTOMS OF CANCER 1949-50-53
Rate - per - 100
50
40
30
20
10
0
Waltham
Gallup Poll
Waltham
Gallup Poll
1949
1950
1953
1953

CHART 3

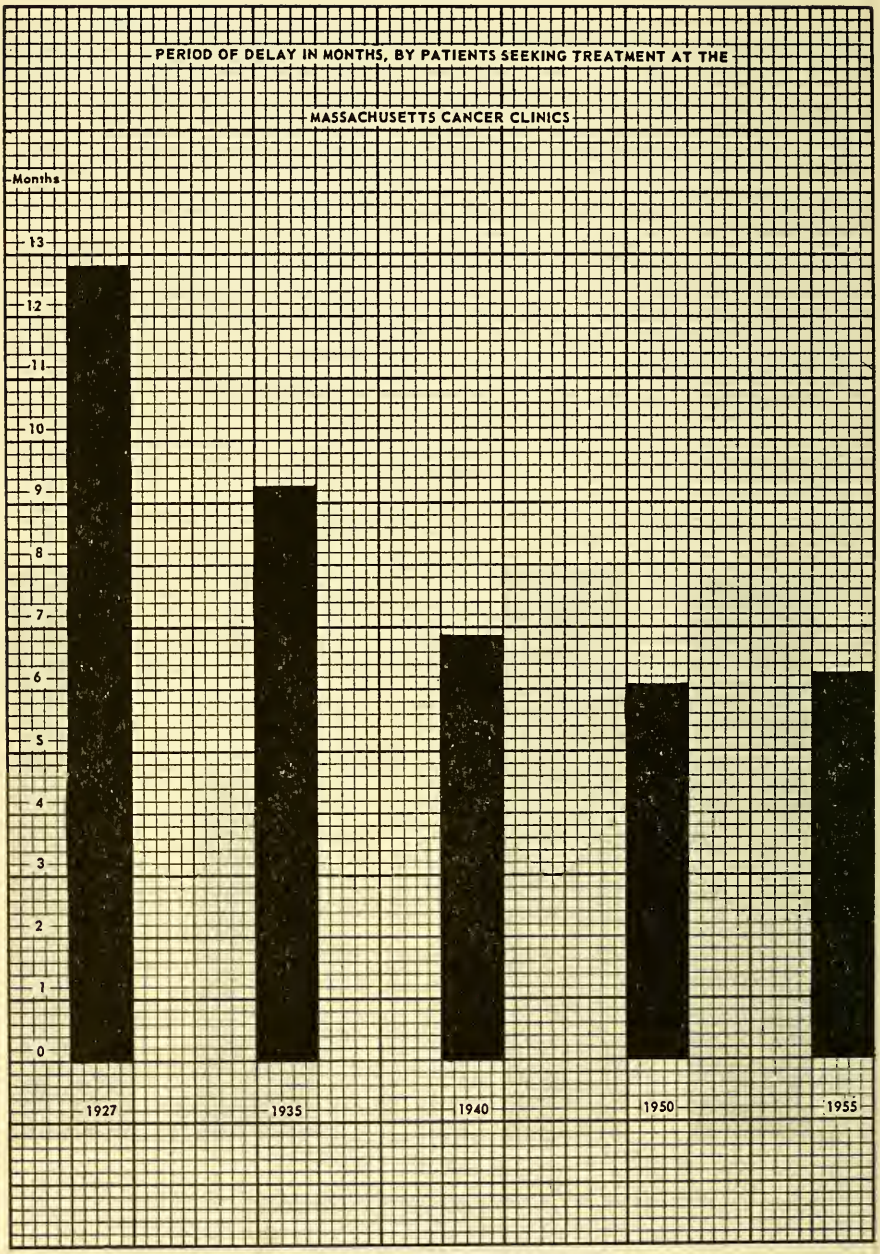

PERIOD OF DELAY IN MONTHS, BY PATIENTS SEEKING TREATMENT AT THE
MASSACHUSETTS CANCER CLINICS
Months
13
12
11
10
9
8
7
6
5
4
3
2
1
0
1927
1935
1940
1950
1955

CHART 4

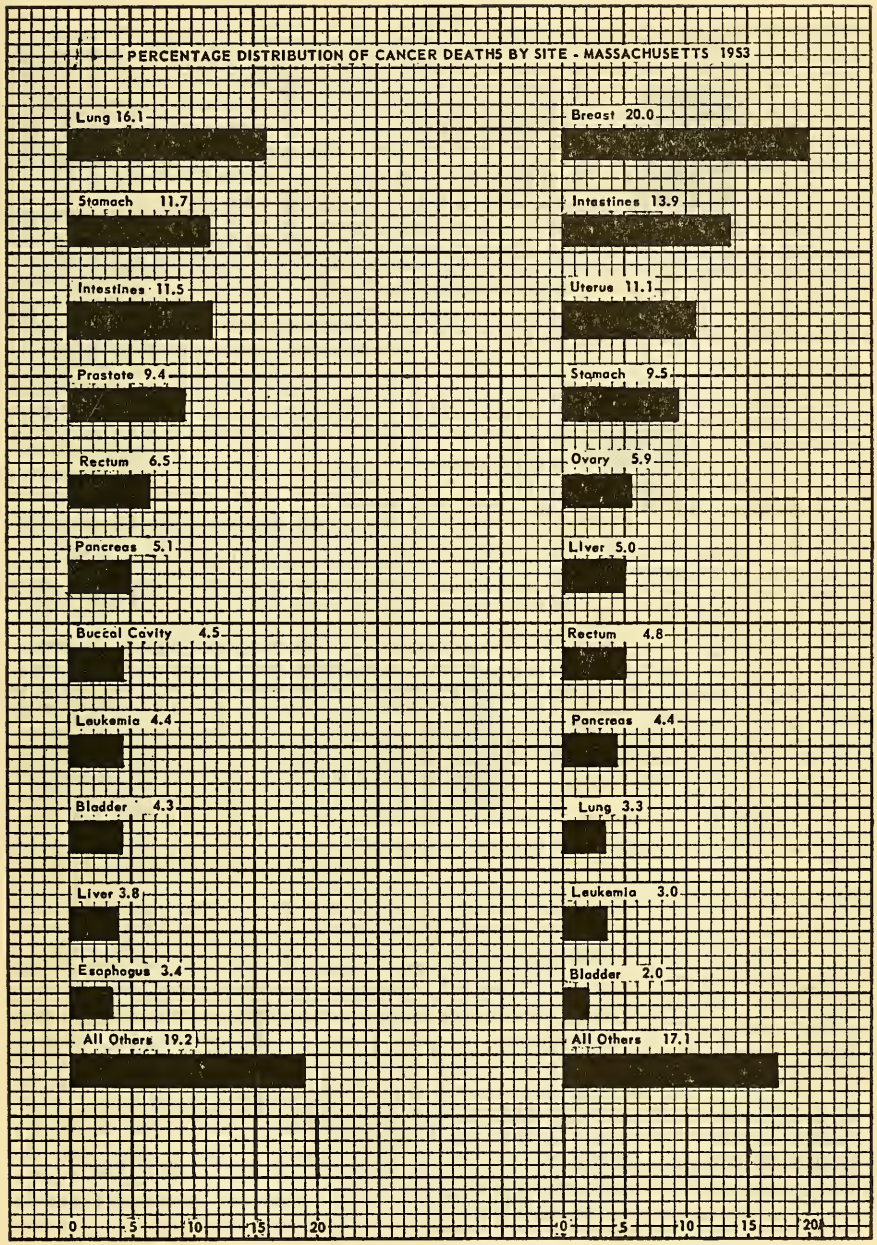

PERCENTAGE DISTRIBUTION OF CANCER DEATHS BY SITE - MASSACHUSETTS 1953
Lung 16.1
Stomach 11.7
Intestines 11.5
Prostate 9.4
Rectum 6.5
Pancreas 5.1
Buccal Cavity 4.5
Leukemia 4.4
Bladder 4.3
Liver 3.8
Esophagus 3.4
All Others 19.2
0 5 10 15 20
Breast 20.0
Intestines 13.9
Uterus 11.1
Stomach 9.5
Ovary 5.9
Liver 5.0
Rectum 4.8
Pancreas 4.4
Lung 3.3
Leukemia 3.0
Bladder 2.0
All Others 17.1
0 5 10 15 20

CHART 5

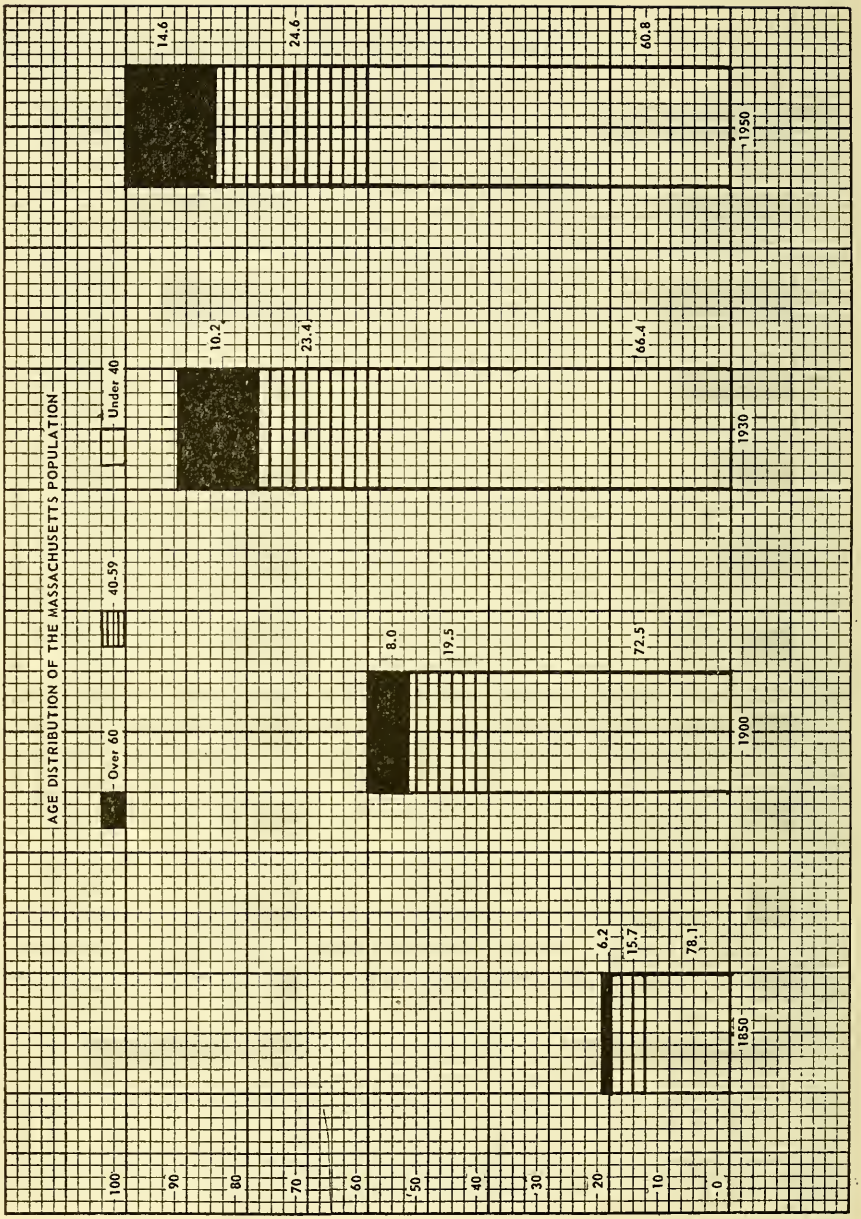

AGE DISTRIBUTION OF THE MASSACHUSETTS POPULATION
Over 60
40-59
Under 40
100
90
80
70
60
50
40
30
20
10
0
6.2
15.7
78.1
1850
8.0
19.5
72.5
1900
10.2
23.4
66.4
1930
14.6
24.6
60.8
1950

CHART 6

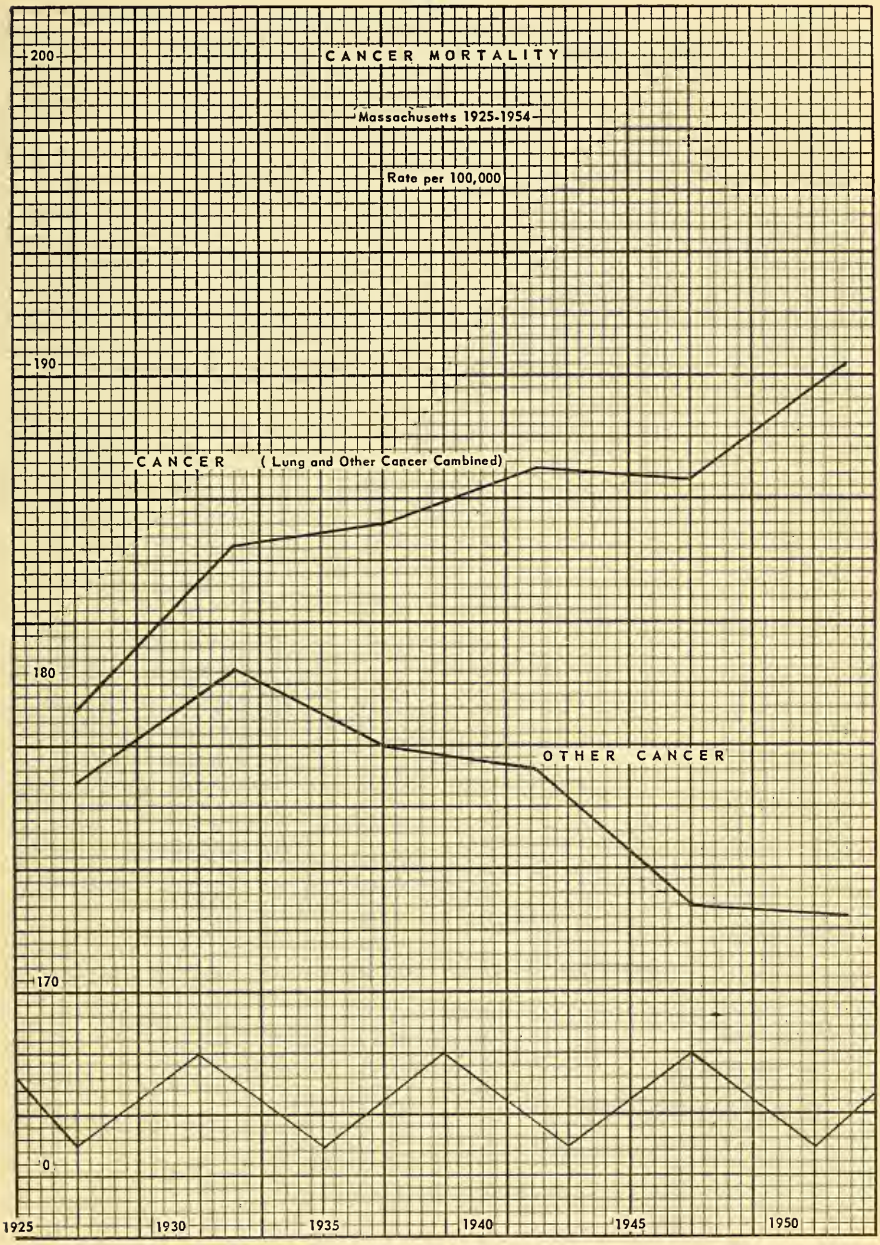

CANCER MORTALITY
Massachusetts 1925-1954
Rate per 100,000
200
190
180
170
0
CANCER (Lung and Other Cancer Combined)
OTHER CANCER
1925
1930
1935
1940
1945
1950

CHART 7

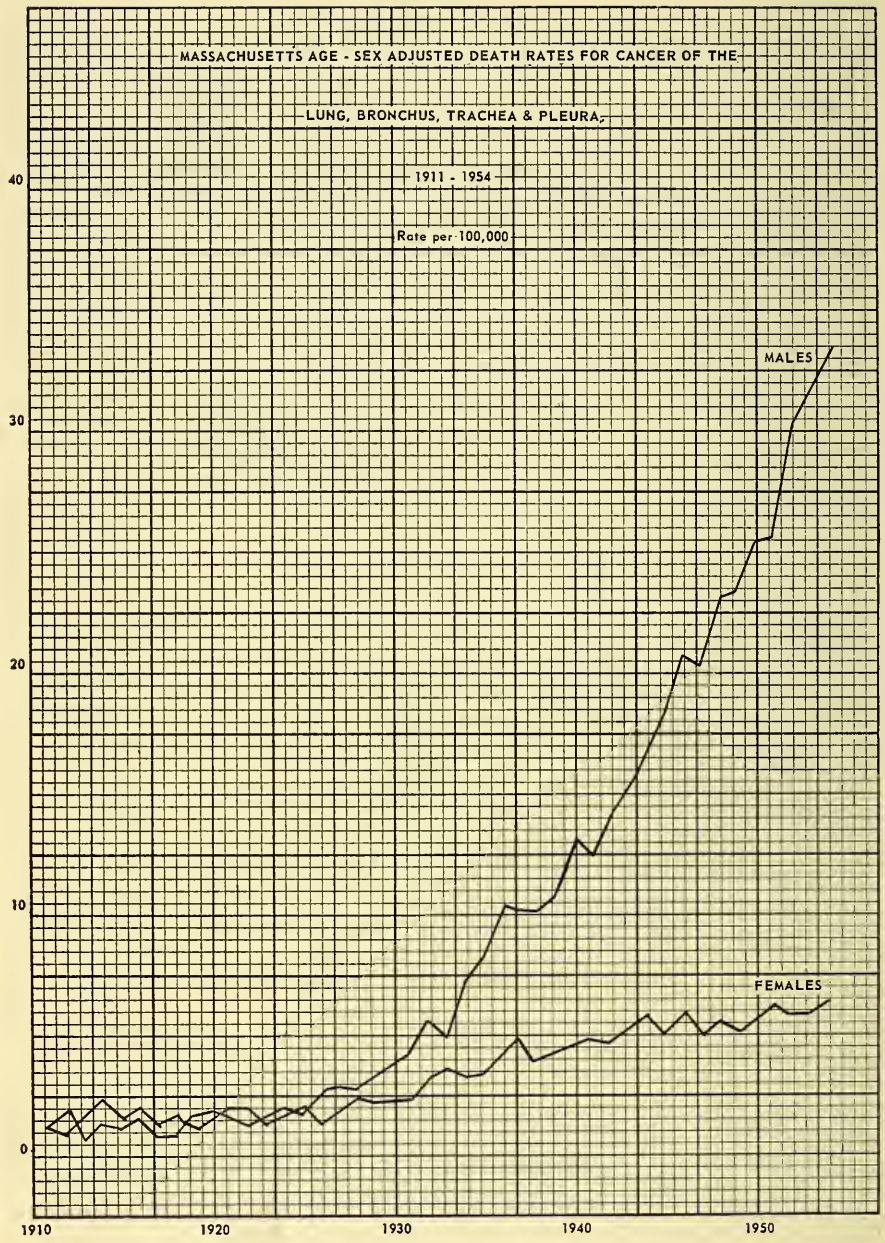
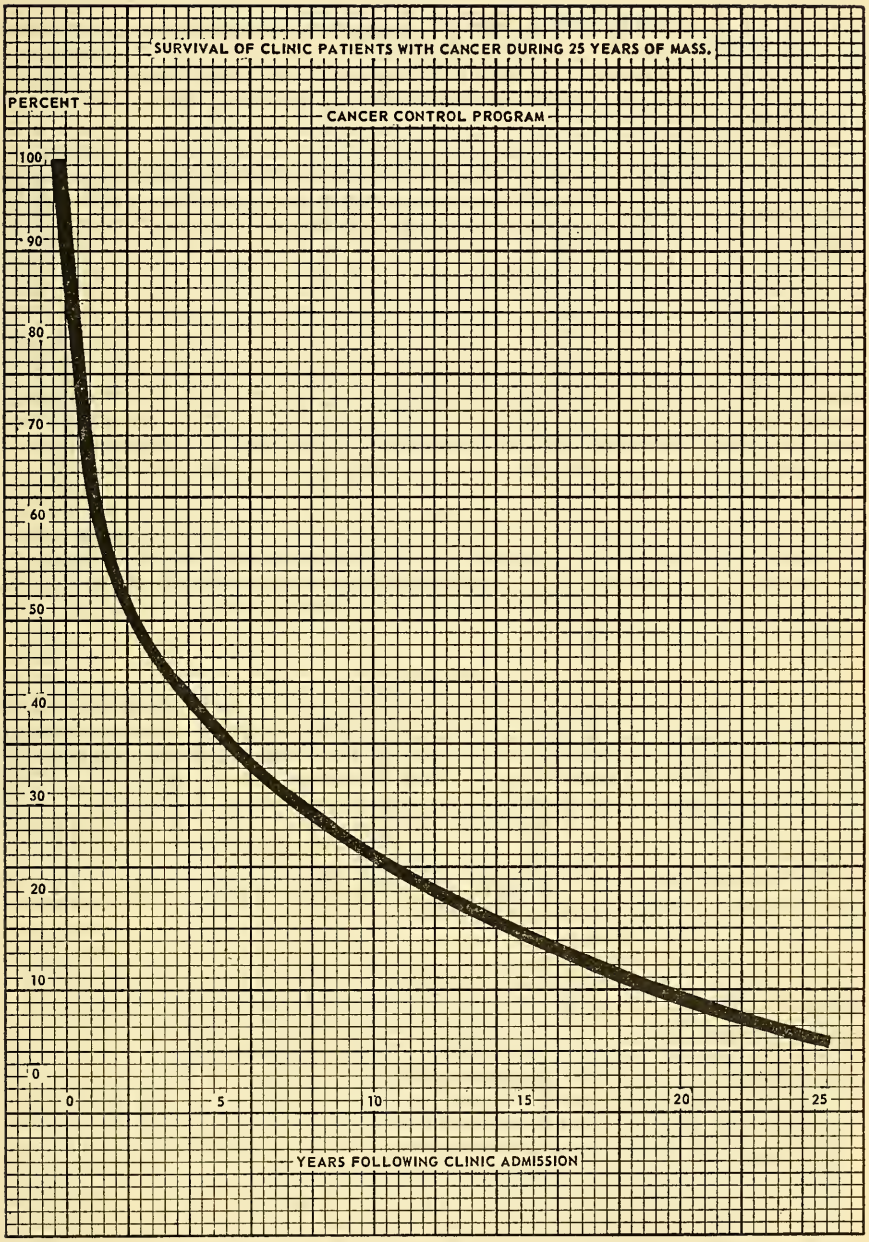

MASSACHUSETTS AGE - SEX ADJUSTED DEATH RATES FOR CANCER OF THE
LUNG, BRONCHUS, TRACHEA & PLEURA,
1911 - 1954
Rate per 100,000
MALES
FEMALES
40
30
20
10
0
1910
1920
1930
1940
1950

CHART 8


SURVIVAL OF CLINIC PATIENTS WITH CANCER DURING 25 YEARS OF MASS.
CANCER CONTROL PROGRAM
PERCENT
100
90
80
70
60
50
40
30
20
10
0
0
5
10
15
20
25
YEARS FOLLOWING CLINIC ADMISSION

## DIVISION OF ALCOHOLISM

The Division of Alcoholism was established by an act of the General Court signed by the Governor on August 17, 1950. Under this act the Department of Public Health was authorized to develop a program for alcoholism. The objectives assigned to the Department were threefold: (1) the establishment of such clinic and hospital facilities as are necessary for the proper diagnosis, treatment, and rehabilitation of persons addicted to the excessive use of alcoholic beverages; (2) the study of problems related to alcoholism; (3) the promotion of a preventive and educational program concerned with the problems of alcoholism.

In order to carry out the provisions of this law the Department established the Division of Alcoholism as of November 17, 1950. The alcoholism program is organized on the basic principle that the alcoholic is a sick person who can be helped to recovery and is worthy of such assistance; furthermore, "that when an illness becomes so widespread in the population, so serious in its effects, so costly in its treatment that the individual cannot cope with it himself, it then becomes a public health responsibility." This quotation is from Dr. Thomas Parran, former Surgeon General of the United States Public Health Service.

Alcoholism is now considered to be the fourth most important public health problem in the United States, being exceeded in importance only by heart disease, tuberculosis, and cancer. The distinguishing characteristic of the modern approach to this age-old problem is the understanding that alcoholism is a progressive disease or illness which may be arrested at any stage in development, but once established can only be successfully controlled by total abstinence. While we do not as yet have a complete understanding of the exact pathologic changes that go on in the body during the progress of this disease, we do know that it is an irreversible reaction and that it seems to be in the nature of a sensitized phenomenon similar to, but not identical with, anaphylaxis. It has been believed for ages that once an alcoholic always an alcoholic. This belief has been confirmed by recent scientific study and is the basis for the saying that for the alcoholic "one drink is too many and a thousand not enough."

### Administration

The Division of Alcoholism occupies a suite of offices on the fifth floor of No. 8 Beacon Street, Boston. It has an authorized staff of a Director, Assistant to the Director, Supervisor of Social Services, and Senior Clerk and Stenographer. The first director of the Division was Dr. John C. Ayres, who resigned his position with the Department to become Commissioner of Health in Springfield. On August 1, 1953 Dr. James B. Moloney was appointed Director and remains to the present time.

The State cooperating alcoholism clinics are 10 in number; they are used for the diagnosis, treatment, and rehabilitation of persons addicted to the excessive use of alcoholic beverages.

These clinics are located in the out-patient departments of general hospitals. The Department reimburses these hospitals for the operation of these alcoholism clinics in accordance with the standards set by the Division of Alcoholism. Each of these clinics has a physician-in-charge who is particularly trained in the clinical aspects of the treatment of alcoholism. The physician-in-charge assumes the responsibility for the clinical management of all patients in that clinic. He is assisted by one or more physicians in accordance with the size and case load of the clinic. In addition to the physicians, the clinics have full-time social workers, and in some the services of a psychologist are used on a part-time basis. Clerical assistants are employed on a full-time basis in all the clinics.

One of the key individuals in the cooperating clinic team is the social worker, who interviews all patients. Therefore, the social worker must be an individual endowed with tact and understanding and one who wins the confidence of the patient.

Essential to an alcoholism control program is the adequate reporting of patients with alcoholism. Table I depicts the number of patients admitted to the co-

operating clinics from 1951 to 1955, inclusive. Table II shows the referral source of patients admitted to the clinics. Table III gives the occupation status of patients admitted, and Table IV depicts the age and status of patients discharged from the cooperating clinics.

TABLE I — *Age and Sex of Patients Admitted to Clinics for Alcoholism*
1951–1955

| Age | 19.1 M | F. | 1952 M. | F. | 1953 M. | F. | 1954 M. | F. | 1955 M. | F. | Total M. | F. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 10–14 | 1 | – | 3 | 2 | – | – | – | – | – | – | 4 | 2 |
| 15–19 | 2 | – | 7 | 5 | 1 | – | – | – | 1 | 1 | 11 | 6 |
| 20–24 | 5 | 3 | 37 | 12 | 6 | 1 | 14 | 6 | 13 | 3 | 75 | 25 |
| 25–29 | 30 | 6 | 70 | 18 | 48 | 9 | 39 | 8 | 45 | 10 | 232 | 51 |
| 30–34 | 73 | 16 | 87 | 21 | 81 | 14 | 61 | 21 | 90 | 19 | 392 | 91 |
| 35–39 | 79 | 19 | 82 | 29 | 73 | 14 | 69 | 31 | 132 | 30 | 435 | 123 |
| 40–44 | 86 | 27 | 79 | 11 | 88 | 31 | 90 | 26 | 138 | 30 | 481 | 125 |
| 45–49 | 63 | 17 | 55 | 9 | 90 | 18 | 90 | 16 | 128 | 25 | 426 | 85 |
| 50–54 | 39 | 9 | 33 | 10 | 45 | 14 | 55 | 10 | 103 | 19 | 275 | 62 |
| 55–59 | 19 | 6 | 10 | – | 20 | 5 | 37 | 5 | 42 | 7 | 128 | 23 |
| 60–64 | 8 | 5 | 5 | – | 14 | 2 | 14 | 4 | 19 | 10 | 60 | 21 |
| 65–69 | – | – | 1 | – | 4 | – | 7 | 1 | 8 | 2 | 20 | 3 |
| 70–74 | 3 | – | – | – | 2 | – | 2 | – | 6 | – | 13 | – |
| 75–79 | 1 | – | – | – | – | – | 1 | – | 1 | 1 | 3 | 1 |
| 80–84 | – | – | – | – | – | – | – | – | 1 | – | 1 | – |
| Not Stated | – | 2 | 4 | 1 | 4 | – | 2 | 2 | 5 | 1 | 15 | 6 |
| Total | 409 | 110 | 473 | 118 | 476 | 108 | 481 | 130 | 732 | 158 | 2571 | 624 |

TABLE II — *Referral Source of Patients Admitted to Clinics for Alcoholism*
1951–1955

| Source | 1951 | 1952 | 1953 | 1954 | 1955 | Total |
|---|---|---|---|---|---|---|
| Self | 154 | 152 | 96 | 111 | 83 | 596 |
| Relative | 54 | 56 | 46 | 39 | 136 | 331 |
| Friend | 52 | 55 | 37 | 30 | 77 | 251 |
| Court | 83 | 84 | 84 | 78 | 52 | 381 |
| Social Agency | 38 | 60 | 54 | 98 | 101 | 351 |
| Physician | 60 | 96 | 120 | 132 | 220 | 628 |
| Spouse | 24 | 15 | 19 | 20 | 16 | 94 |
| Clergy | 6 | 13 | 6 | 26 | 40 | 91 |
| A. A. | 11 | 12 | 16 | 35 | 57 | 131 |
| Other | 37 | 48 | 106 | 42 | 108 | 341 |
| Total | 519 | 591 | 584 | 611 | 890 | 3195 |

TABLE III — *Occupational Status of Patients Admitted to Clinics for Alcoholism*
1951–1955

| Occupation | 1951 | 1952 | 1953 | 1954 | 1955 | Total |
|---|---|---|---|---|---|---|
| Professional workers | 8 | 20 | 39 | 18 | 32 | 117 |
| Semiprofessional workers | 16 | 8 | 6 | 15 | 25 | 70 |
| Proprietors, managers and officials | 25 | 22 | 22 | 36 | 44 | 149 |
| Clerical and Sales | 98 | 93 | 86 | 77 | 128 | 482 |
| Craftsmen, foremen | 87 | 90 | 99 | 108 | 217 | 601 |
| Operatives | 21 | 27 | 49 | 31 | 48 | 176 |
| Service workers, domestic | 5 | 37 | 9 | – | 13 | 64 |
| Not domestic | 62 | 41 | 61 | 113 | 119 | 396 |
| Laborers | 110 | 156 | 100 | 97 | 144 | 607 |
| Housewives | 56 | 40 | 32 | 43 | 69 | 240 |
| Students | 3 | 2 | – | 1 | 3 | 9 |
| Military | 3 | 2 | 2 | – | 3 | 10 |
| Not stated | 25 | 53 | 79 | 72 | 45 | 274 |
| Total | 519 | 591 | 584 | 611 | 890 | 3195 |

TABLE IV — *Age and Status of Patients Discharged from Clinics for Alcoholism* 1951–1955

| Age | Recovered | Self-Terminated or Lost | Unresponsive or Uncooperative | Total |
|---|---|---|---|---|
| 15–19 | 1 | 1 | 1 | 3 |
| 20–24 | 12 | 14 | 8 | 34 |
| 25–29 | 32 | 57 | 35 | 124 |
| 30–34 | 87 | 107 | 86 | 280 |
| 35–39 | 86 | 114 | 91 | 291 |
| 40–44 | 129 | 107 | 83 | 319 |
| 45–49 | 119 | 107 | 63 | 289 |
| 50–54 | 67 | 77 | 46 | 190 |
| 55–59 | 49 | 37 | 17 | 103 |
| 60–64 | 26 | 10 | 10 | 46 |
| 65–69 | 6 | 4 | 3 | 13 |
| 70–74 | 5 | – | – | 5 |
| 75–79 | 1 | – | – | 1 |
| 80–84 | 1 | – | – | 1 |
| Not stated | 8 | 15 | 6 | 29 |
| Total | 629 | 650 | 449 | 1728 |

## TREATMENT

There are three prime requisites for the successful treatment of alcoholism. The first is that the person suffering from this illness admit that he is in need of help; second, he must request help; and third, he must agree to cooperate in treatment. Given these three essentials, a person suffering from this illness has a good chance of recovery and rehabilitation. The road back to sobriety is difficult and is beset with many obstacles, and the goal of complete rehabilitation means readjustment to complete social living, but it can be accomplished, as has been demonstrated so admirably by the thousands of persons who have recovered from alcoholism through Alcoholics Anonymous.

Popular belief to the contrary notwithstanding, the typical alcoholic is not invariably a "Skid Row" character. Representatives from all levels of society succumb to alcoholism, from the humblest unskilled manual laborer to the most highly trained mechanical and professional worker. Alcohol is no respecter of persons. Anyone can be caught in the mire of addictive drinking if he drinks steadily enough and for a sufficiently long period of time. This does not mean that abnormal persons, or those suffering from personality defects or aberrations, may not become alcoholics, because they frequently do. But the alcoholism is probably separate and distinct from the underlying personality defect.

The out-patient clinic is the basic unit of service to the alcoholic. In each case the different problems involved are studied and plans are formulated for treatment. The individual must be helped to adjust his life, without alcohol, to the community and environment wherein he lives or expects to live. Merely to keep the alcoholic sober in the artificial environment of an institution or in complete dependence on a therapist is expensive, ineffective, and bound to lead to failure.

Establishment of such cooperating clinics in out-patient departments of general hospitals offers many advantages. To the alcoholic, it means the acceptance of his affliction as a disease to be cared for in a facility where other ailments are similarly treated. This tends to remove the stigma so frequently attached to alcoholism, and it renders the alcoholic more ready and willing to recognize, admit, and accept his inability to handle alcohol and to seek help. To the physician, it means the ready availability of a specialized diagnostic and therapeutic service necessary for treating patients as a whole. To the hospital staff, it offers first-hand knowledge as to the nature of alcoholism and its treatment. Furthermore, it makes available a facility where patients primarily admitted or hospitalized for an organic illness may be referred for study and treatment of a secondary alcoholic problem. To the hospital, it also means the offering of additional beneficial services to the community, thereby increasing its value to the community at large.

Drugs used in the treatment of alcoholism are of two main categories: (1) prophylactic and (2) symptomatic.

The drug disulfiram, more popularly known as antabuse, originated in Denmark, and at first was hailed as the long-sought for "cure" for alcoholism. But the initial enthusiasm has waned, and now it is considered to be a potentially dangerous drug which may have some value when skillfully used. In effect this drug puts a psychological barb-wire fence around the alcoholic, or in fact any person so far as taking the first glass of an alcoholic beverage is concerned. But the effect lasts only a few days after cessation of taking the pills. The drug has many contraindications and can only be given with the knowledge, consent, and cooperation of the patient. The symptomatic drugs, as the name implies, are tranquillizers, and in skillful hands probably have some value. But drug therapy is only an adjunct, and not necessarily a requisite adjunct, to treatment. Psychiatric and supportive social therapy are used as indicated. Each case is individualized and treatment is offered on this basis. This, however, does not preclude the use of group therapy in suitable cases.

In the final analysis, alcoholism is a biosocial problem of the first magnitude, which requires the combined efforts and resources of several disciplines for its solution. Medicine, psychiatry, and social service are involved in the remedial or therapeutic phase, but the only way that alcoholism can be prevented — and after all, prevention is the prime objective of all public health work — is through education.

## Education

The third objective assigned the Department by the original legislation was the "promotion of a preventive and educational program concerned with the problems of alcoholism." This is a particularly difficult assignment, as there has been no concise and authoritative declaration of principles by the leaders in the field of alcoholism. The restrictions imposed by the protagonists of both the "Wets" and the "Drys" and the diverse cultural and religious backgrounds of pupils make the path of the alcoholism educator narrow indeed.

The plan of operation, therefore, in dealing with this problem of education for prevention has been to adhere strictly to an objective presentation of scientifically demonstrable facts, so that each individual may preserve his inalienable right to his own decision as to drink or not to drink alcoholic beverages.

## DIVISION OF COMMUNICABLE DISEASES

Roy F. Feemster, M.D., Dr. P.H., *Director*

### General Statement

The period 1950–1955 was ushered in by a general low prevalence of communicable diseases, 1950 showing the lowest total since 1916. The next two years showed an increase, reaching 119,000 cases in 1952. This was followed in 1953 with a drop to about the same level of 1950, and a gradual rise again to 112,000 in 1955. These fluctuations are due largely to variations in the acute communicable diseases of childhood.

### Prevalence of Communicable Diseases

*Brucellosis* — This disease, which was formerly tabulated under undulant fever, has been at a consistently low level during the six-year period. Only once were more than 20 cases reported in a single year. In 1955 only nine cases were reported. Since the disease in the past has been largely due to the bovine organism and has been transmitted by milk, this is a good measure of the widespread acceptance and efficient application of pasteurization.

*Chicken Pox* — This disease did not fall below 12,000 cases per year during the period, and in 1953 it exceeded 23,000 cases, the highest number ever recorded. It is interesting to compare this incidence of a disease for which we have no immunization with that of smallpox, which has completely disappeared from the State.

*Diphtheria* — After 25 years of increasing acceptance of diphtheria immunization and a continual increase in the effectiveness of the agents, diphtheria is finally declining to almost the vanishing point. The incidence dropped below 100 for the first time in the history of the State in 1951, and during the last four years has only once exceeded 30 cases per year. In 1955 only 19 cases were reported.

*Dysentery, Bacillary* — For some undetermined reason this disease showed a sudden increase in 1953, confined largely to some of the larger municipal areas in the State, and occurring especially among families in low-income groups. Without any increased measures of control the disease has gradually declined since that date.

*Encephalitis, Infectious* — This disease has been at the highest level during the period since the occurrence of Von Economo's disease in the '20s and '30s. The disease may have resulted from the increased interest in virus diseases and greater use of virus laboratories in making diagnoses. Some of the cases are no doubt due to Coxsackie viruses and ECHO viruses.

In 1955 there was a mild recurrence of eastern equine encephalomyelitis, resulting in four human cases and illness in more than 40 horses.

*Gastroenteritis* — This disease, as such, is not reportable except that the Department must be informed when outbreaks occur. Many of the cases, of course, are eventually reported as Salmonella infections or bacillary dysentery. The bulk of the outbreaks, however, are usually due to staphylococcus food poisoning. A list of the outbreaks which have been brought to the attention of the Department will be found in the tabulation of outbreaks later in this report.

*German Measles* — Except for 1952, when 15,000 cases were reported, this disease has been at a low level throughout the period.

*Hepatitis, Infectious* — This disease showed a rapid increase, beginning in 1952 and reaching nearly 1300 cases in 1954. In 1955 it dropped to under 900 cases. This rise in incidence is a part of a national wave of the disease. Until we have further experience it is difficult to determine whether the rise was due to increased reporting by physicians who were just discovering that the disease should be reported or whether the increase was real. If it eventually turns out that we have nearly 1000 cases per year, an increase to 1300 would mean very little.

*Malaria* — Reported cases of this disease have very little significance since they are all acquired outside of the State.

*Measles* — The period was characterized by two record outbreaks of this disease — the highest in 1952 — but more than 50,000 cases were reported in 1955. In

spite of this high prevalence the number of deaths remained below any other period in the past.

*Meningitis, Meningococcal* — This disease fluctuated between 60 and 85 cases during the period. In spite of the fact that the sulfonamides and other specific treatments are quite effective, the deaths fluctuated between 13 and 27 per year.

*Meningitis, Other Forms* — The influenza bacillus is responsible for one-half to two-thirds as many cases as the meningococcus, but almost equals the number of deaths. Because of the frequent reporting of aseptic meningitis, which was formerly confused with nonparalytic poliomyelitis, meningitis undetermined has been on the increase.

*Mumps* — Mumps rose to the highest level in the history of the State in 1954, with over 18,000 cases recorded. On the other hand, three years during the period have shown only about half that number of cases.

*Poliomyelitis* — Interest in this disease has continued to mount. In 1953 the Division participated in a nation-wide evaluation of the usefulness of gamma globulin in the prevention of the paralysis of poliomyelitis. These studies were disappointing because it was not possible to show that there was any great value in its use in household contacts after a case had occurred.

In 1954 the Department participated in the nation-wide poliomyelitis vaccine field trials, during the course of which more than 14,000 children in the first, second, and third grades of 25 communities received polio vaccine and an equal number an inert material. Massachusetts' contribution to this study was minimal because poliomyelitis was at a low level during this study, and because many of the cases which were reported as poliomyelitis were really minor illnesses due to confused viruses.

Two events characterized the year 1955: first, the giving of one dose of polio vaccine to first and second grade children throughout the Commonwealth, and then the long pause in the program due to the fact that some lots of vaccine proved unsafe. The second event was the largest outbreak of poliomyelitis that ever occurred in this state, 3950 cases having been recorded. With funds made available by the National Foundation for Infantile Paralysis, a special study of the value of one dose of polio vaccine was carried out during the progress of this epidemic. This study demonstrated the usefulness of even one dose in an epidemic situation.

*Rabies* — Not only were there no human cases of rabies during the period, but there were no rabid animals discovered in the State. Under such circumstances it becomes increasingly difficult to maintain inoculation of dogs with rabies vaccine. If the disease should be reintroduced by a dog coming in during the incubation period, the low immunity of the dog population might furnish an opportunity for an epidemic among animals.

*Salmonellosis* — There was a continual rise in the incidence of this disease during the period, going from about 70 cases in 1950 to nearly 350 in 1955. This disease is difficult to control because the reservoir of infection lies among animals and is introduced into the human population by animal foods which we consume. The bulk of the cases occur as single cases or small family outbreaks, but occasionally there is a small epidemic when a kitchen becomes infected with the organism. A table giving the varieties of Salmonella organisms most frequently encountered appears in Volume II of this report.

*Scarlet Fever* — This disease has been at a low level during the whole period, due partly, no doubt, to the mildness of the disease in recent years, but also due to the widespread use of sulpha drugs and antibiotics which keep down the numbers of streptococci harbored in the population.

*Smallpox* — The continued absence of this disease from the State is heartening but is partly explained by the fact that 300,000 doses of smallpox vaccine are distributed annually for immunization purposes. It is now almost 25 years since a case of the disease occurred in Massachusetts.

*Typhoid Fever* — Only once during the period were there more than 25 cases reported in a single year. The period ended with the lowest prevalence of the disease ever recorded.

The number of typhoid carriers on our list is gradually declining, due to the advanced age of most of the carriers and to the fact that there is little replacement following active cases of the disease.

*Whooping Cough* — Since the first year in this period whooping cough has been making new low records of prevalence. The period ended with the lowest incidence of the disease that has ever been recorded in the State. Much of this is, of course, due to the widespread use of pertussis vaccine now included in our triple antigen for the immunization of preschool children.

*Other Diseases* — Occasional cases of anthrax, psittacosis, Rocky Mountain spotted fever, trichinosis, and tularemia continue to occur, but the incidence of these diseases was not remarkable during the period.

## Reorganization

In 1950 the Diagnostic Laboratory, consisting of the two divisions, the Bacteriological Laboratory and the Wassermann Laboratory, was transferred to the Institute of Laboratories. No further mention of the activities of the Laboratories will be made in the report of this Division.

## Epidemiology

Due to the inadequate salary for the Assistant Director, this position has not been kept filled, so that during a good portion of the period only one physician, in addition to the Director, has been available for carrying on the work of the Division. In addition, the number of district health officers has been reduced to five, and since they usually make the primary investigations, each has more work to do. Consequently, the records of the Division have been falling behind. This situation would have been acute, indeed, if the number of epidemics had not been on the decrease. Those which have occurred have been mainly staphylococcus food poisoning and Salmonella infections.

## Special Projects and Studies

*Diphtheria Study* — The study on the practicability of immunizing high school students against diphtheria without preliminary Schick tests was concluded early in the period, and the program for giving diphtheria toxoid to high school students was incorporated in our recommendations regarding immunizations.

*Boston Exanthem* — Early in the period, a study was carried out with the assistance of Dr. Neva of the Children's Medical Center on an illness characterized by a skin rash which differed from measles, German measles, scarlet fever, roseola infantum, and other childhood diseases. Eventually Dr. Neva was able to isolate a virus from specimens from these children and the new disease was named the Boston exanthem.

*Equine Encephalitis* — In 1953, meteorological conditions in the spring made it appear that a bad mosquito year was in prospect, and it was feared that encephalitis due to the eastern equine virus might reappear. A study was undertaken to determine if the virus was present in the State, with the assistance of the Virus and Rickettsia Laboratory of the Public Health Service. About 150 specimens of blood from birds were sent to the laboratory for examination. Nearly one-fourth of them showed evidence that the birds had been infected with either the eastern or western virus. In addition, the eastern virus was isolated from one bird. The eastern virus was also isolated from a horse which had been diagnosed as having horse sleeping sickness. This was good evidence that the virus was present in the State in 1953.

*Poliomyelitis* — In the midst of the 1955 outbreak of poliomyelitis, the Department was asked by the National Foundation for Infantile Paralysis to undertake a study of the usefulness of one dose of polio vaccine in preventing the paralysis of poliomyelitis. Since the staff of the Division was too heavily loaded with work connected with the outbreak, it was necessary to organize a team of temporary workers to carry out the project. This study revealed that one dose of vaccine was quite effective in preventing paralysis.

*Milk Regulations* — This Division continued its interest in passing the regulations requiring the pasteurization of milk. During the period, the number of communities which had such regulations increased from 111 to 146. Pamphlets are regularly supplied by the Division on various aspects of milk and its value as a food and danger as a carrier of disease, to assist in obtaining the passing of such regulations.

## Interstate Problems

During the period, the Director has participated in making several studies regarding problems which involve numerous states.

*Rabies* — Two conferences in New York City were attended by representatives of the states of New England as well as New York, Pennsylvania, and New Jersey. Early in the period invasion in Massachusetts from eastern New York was feared and special vigilance was being observed to discover if any rabid animals were entering the State from the west. New York and Pennsylvania were both having acute problems with rabies in wildlife, with accompanying loss of domestic animals bitten by foxes. Control measures have reduced the disease in these two states, and the threatened invasion in Massachusetts has not taken place.

*Gamma Globulin* — In 1953, the National Foundation for Infantile Paralysis released gamma globulin for the prevention of poliomyelitis, and since there was great question in regard to its possible usefulness, a national study was undertaken. The Director was a member of the national committee and attended several meetings outside the State in regard to the problem. The study failed to reveal any practical usefulness of gamma globulin.

*Polio Vaccine Field Trials* — When the National Foundation for Infantile Paralysis undertook a national study of the usefulness of Salk's polio vaccine, the Director was a member of a national committee which guided the direction of the study. Several meetings were held in New York City, Atlanta, and Columbus, Ohio. The studies were evaluated by a group at the University of Michigan headed by Dr. Thomas Francis and proved conclusively that polio vaccine gave protection against paralysis.

*Mass Use of Polio Vaccine* — The same committee which had guided the studies of the field trials of polio vaccine was called upon to guide the use of the vaccine furnished by the National Foundation for Infantile Paralysis in 1955, and to make recommendations in regard to the distribution of polio vaccine in 1956. The Director attended several out-of-state meetings in connection with this committee and also meetings called by the Public Health Service.

## Pakistan Program

In 1952, when the Department undertook to staff the health team being sent to Pakistan by the Department of State of the United States Government, the Director was sent to Pakistan on a three-months trip to make preliminary plans for the work of the team. Thereafter, he continued for a time as a member of the Advisory Committee of the Department on the Pakistan Program.

## Residency Training

When the Department undertook to provide residency training for physicians in preventive medicine, the Director was asked to assume responsibility as Educational Director for this program. He attended a national meeting on the program at the University of North Carolina and worked with the Department's Director of Training in setting up the program for this group.

## Revision of Regulations

A number of changes were made in the isolation and quarantine requirements for communicable diseases in 1952. Proposed changes were submitted to an Advisory Committee for revisions before adoption.

## Communicable Disease Information

Early in the period, the Division was publishing information in regard to communicable diseases in its weekly publication called *Communicable Disease Information.* In 1952, this publication became a departmental outlet for news and the name was changed to *This Week in Public Health.* The information which had been going out previously in the publication of the Division has continued to be included in the departmental organ. Those articles on communicable diseases of wider interest are reprinted in pamphlet form for distribution. The Director also acted as editor of the Department's column in the *New England Journal of Medicine.*

## Publications

During this period the Division was responsible for the publication of the following articles:

Clinical and Epidemiological Features of an Unusual Epidemic Exanthem, by Franklin A. Neva, M.D., Roy F. Feemster, M.D., and Ilse J. Gorbach, M.D., *Journal of the American Medical Association,* 155: 544–548 (June 5, 1954).

An Outbreak of Salmonellosis Traced to Watermelon, by Gilbert E. Gayler, M.D., Robert A. MacCready, M.D., Joseph P. Reardon, M.D., and Bernard F. McKernan, M.D., *Public Health Reports,* 70: No. 3 (March, 1955).

Evaluation of Poliomyelitis Vaccination in Massachusetts, Alton S. Pope, M.D., Roy F. Feemster, M.D., David E. Rosengard, M.D., Florence R. B. Hopkins, M.D., Boris Vanadzin, M.D., and Edgar W. Pattison, M.S., *New England Journal of Medicine,* 254: 110–117 (January 19, 1956).

Note: Statistical tables showing the incidence of diseases are shown in Volume II of this report.

## DIVISION OF DENTAL HEALTH

This report covers the second half of the first decade of this Division's activities. During this period the staff of nine professional dental personnel and three clerical personnel have directed their energies to the control of dental diseases by contributing to the development of specific preventive procedures, control methods, and dental health educational procedures at the community level.

The practical application of the first major technical breakthrough in the prevention of dental caries by the fluoridation of water supplies has not only produced encouraging trends in the suppression of tooth decay, but has stimulated more public and professional discussion on the public health significance of dental disabilities than in any other period in the Department's history.

### Fluoridation

Twenty Massachusetts communities began the fluoridation of their water supplies on a continuing basis during this period — the first beginning in May, 1951. In most of these communities the Division has taken baseline dental caries prevalence measurements for future evaluation purposes. In those communities of oldest fluoridation history interim measurements have indicated the beginning of dental caries suppression. An example of the order of these findings is included in Table I.

The subject of fluoridation has usually been attended by considerable public debate in those communities where it has come up for official consideration. The Division has served as a resource of information for local officials looking into the question. During this period the probability of a community adopting this procedure once it has opened the subject to popular debate has been about fifty per cent.

### Other Preventive Measures

During these years the topical application of fluoride salts to children's teeth has been attempted by some communities as a public health approach to the prevention of dental caries. In general, the method has been found cumbersome in operation and remains unevaluated in the few locations where it still is practiced.

Educational attempts at reducing excessive carbohydrate consumption as a threat to dental health have been one of the chief foundations of public health efforts in this field.

### Professional Resources

The numbers of dentists and dental hygienists available during this period have grown with the same speed as that of the general population, leaving the dentist-population and dental hygienist-population ratios in a favorable position relative to those of the nation and the other states. The Division has been able to assist the development of these trained personnel by directing material resources to the professional schools in the State through the medium of educational project grants.

For the public health aspects of professional dental training, the Division has designed and conducted in-service training courses for those in public employment. During this time about one-half of the dental hygienists in public health work have received this type of training, but only 5 per cent of the dentists have had this opportunity, as these resources have been available to them only during the last several months of this period.

### Disease Prevalence and Treatment Effectiveness

Requests by communities for evaluation of their dental health programs have provided opportunities for measurement of certain oral diseases. Of chief significance have been the observations on dental caries history of school age children. Tables II and III illustrate this particular disease prevalence and the relative treatment effectiveness for it in a group of communities observed in 1953. These observations were performed under the conditions prescribed by the Council on Dental Health of the American Dental Association for Type III examinations. Repeated observations of this type have left us with the impression that oral disease prevalence has remained unchanged during this period in all areas except those which have undertaken the fluoridation of water supplies. Toward the end of

this period there has been some evidence that a significant improvement has been made in the timely treatment of dental defects by conventional dental operative procedures.

Projections of our observations have led us to the belief that at the close of this period in the school-age population of this State, three teeth were decaying every minute and that one-half of them were receiving timely reparative dental treatment for the control of the disease.

TABLE I — *Fluoridation Data, Athol, Massachusetts,* 1951 *and* 1954

| | Age (in Years) | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | 6 | | 7 | | 8 | | 9 | |
| | 1951 | 1954 | 1951 | 1954 | 1951 | 1954 | 1951 | 1954 |
| Number of Cases | 123 | 164 | 175 | 169 | 178 | 157 | 199 | 119 |
| Percent with one or more DMF | 70 | 33 | 87 | 65 | 99 | 92 | 97 | 94 |
| DMF | 2.07 | 0.79 | 2.81 | 1.75 | 3.93 | 2.81 | 4.75 | 3.70 |
| D/DMF | .98 | .89 | .92 | .85 | .88 | .73 | .82 | .61 |
| M/DMF | .00 | .01 | .00 | .01 | .01 | .02 | .02 | .05 |
| F/DMF | .02 | .11 | .08 | .14 | .11 | .25 | .16 | .34 |

TABLE II — *Average Number of Decayed, Missing, and Filled Permanent Teeth Per Child by Age in Sixteen Massachusetts Communities,* 1953

| Age | Number of Cases | Percent with One or More DMF Teeth | Decayed Teeth Per Child | Missing Teeth Per Child | Filled Teeth Per Child | DMF Teeth Per Child | $\sigma$ obs |
|---|---|---|---|---|---|---|---|
| 5 | 220 | 17% | 0.30 | 0.00 | 0.02 | 0.32 | 0.87 |
| 6 | 1354 | 42% | 0.96 | 0.00 | 0.05 | 1.01 | 1.42 |
| 7 | 845 | 75% | 1.85 | 0.02 | 0.33 | 2.20 | 1.63 |
| 8 | 687 | 88% | 2.42 | 0.06 | 0.56 | 3.04 | 1.73 |
| 9 | 490 | 94% | 2.87 | 0.16 | 0.90 | 3.93 | 2.15 |
| 10 | 345 | 96% | 3.53 | 0.28 | 1.11 | 4.92 | 2.88 |
| 11 | 308 | 99% | 4.97 | 0.49 | 1.49 | 6.95 | 4.11 |
| 12 | 534 | 99% | 5.61 | 0.55 | 2.30 | 8.46 | 4.53 |
| 13 | 600 | 99% | 6.20 | 0.72 | 3.01 | 9.93 | 4.89 |
| 14 | 552 | 100% | 6.20 | 0.83 | 4.20 | 11.23 | 5.19 |
| 15 | 110 | 100% | 7.20 | 1.17 | 4.18 | 12.55 | 6.21 |
| 16 | 92 | 100% | 5.43 | 1.49 | 6.75 | 13.67 | 5.15 |
| 17 | 167 | 100% | 4.97 | 1.47 | 7.78 | 14.22 | 5.84 |

TABLE III — *Average Number of Decayed, Extracted, and Filled Deciduous Teeth Per Child by Age in Sixteeen Massachusetts Communities,* 1953

| Age | Number of Cases | Percent with One or More def Teeth | Number of Decayed Teeth Per Child | Number of Extracted Teeth Per Child | Number of Filled Teeth Per Child | Number of def Teeth Per Child | $\sigma$ obs |
|---|---|---|---|---|---|---|---|
| 4 | 347 | 68% | 2.00 | 0.04 | 0.86 | 2.90 | 3.05 |
| 5 | 427 | 83% | 3.70 | 0.30 | 0.89 | 4.89 | 3.86 |
| 6 | 1427 | 88% | 4.71 | 0.51 | 0.86 | 6.08 | 4.05 |
| 7 | 845 | 91% | 4.48 | 0.73 | 0.97 | 6.18 | 3.60 |
| 8 | 570 | 92% | 4.18 | 0.69 | 0.88 | 5.75 | 3.05 |

## COMMUNITY DENTAL HEALTH PROGRAMS

Assistant communities in the development of their own dental programs has been a major effort of this Division. With the chief efforts directed at the health of the school-age child, these local programs in 1955 screened about one-half the school-age population for the early detection and correction of dental defects by the use of 250 dentists and 79 dental hygienists. By the use of board of health dental clinics they provided dental services to 86,000 children, or approximately 10 per cent of the total population of the age levels they were designed to serve. It is estimated that these local programs reached 25 per cent of the total school population through their health education efforts by use of media prepared by this Division.

## DIVISION OF VENEREAL DISEASES

The Division of Venereal Diseases occupies a suite of offices located on the second floor of the Ford Building, 15 Ashburton Place, Boston. It has an authorized complement of a Director, Assistant Director, two public health nursing supervisors, and a stenographic and clerical staff of 11. The clerical staff consists of one principal clerk, one senior statistical clerk, two senior clerk-stenographers, one junior key punch operator, three junior clerk-stenographers, and three junior clerk-typists.

The Division of Venereal Diseases is one of five divisions in the Bureau of Preventive Medicine. This regrouping of the division into the Bureau of Preventive Medicine took place in fiscal 1955.

### Budget

The appropriation for the fiscal years 1949–1956 follows:

| | Personal Services | Travel | Laboratory, Medical and General Care | Miscellaneous Expenses |
|---|---|---|---|---|
| 1950 | $53,360.00 | $1,432.04 | $314,037.78 | $7,652.00 |
| 1951 | 56,665.00 | 1,250.00 | 313,210.00 | 6,890.00 |
| 1952 | 60,925.00 | 940.00 | 300,120.00 | 8,151.00 |
| 1953 | 61,150.00 | 1,000.00 | 303,980.00 | 6,473.00 |
| 1954 | 54,855.00 | 1,050.00 | 293,400.00 | 4,789.00 |
| 1955 | 63,005.00 | 950.00 | 292,400.00 | 8,554.00 |
| 1956 | 61,590.00 | 950.00 | 292,500.00 | 8,616.00 |

### Modus Operandi

According to Chapter 111, Section 117, of the General Laws, the Division of Venereal Diseases is required to plan, promote, and carry out a sound venereal disease control program. This constitutes prevention of venereal disease as well as finding and treating these diseases when they occur. Thus, the Division must promote good social hygiene measures, initiate case-finding procedures, and provide for diagnostic, treatment, and case-holding facilities.

The Division is not alone in carrying out a preventive program for disease control. It is a well known fact that sexual promiscuity is the underlying factor in the spread of venereal disease; that if sexual promiscuity is reduced or controlled there will be a corresponding decrease in venereal disease. One of the methods used to discourage promiscuity is to make such illicit relationships illegal and punishable under the law. Thus, the fear of legal sanction decreases the extent of promiscuity. More important than the fear of legal sanction is the education of the individual in the principles of sound social hygiene. This is a continuing process beginning in infancy and carried out into adulthood. The education begins in the home and is supplemented by the teachings of the church, schools, physicians, communities, youth agencies, law enforcement groups, welfare, social agencies, etc. All of these groups of people by their concerted action can influence the incidence of sexual promiscuity and venereal disease.

There are 23 state cooperating venereal disease clinics located strategically throughout the State. With the exception of four, they are set up in the outpatient departments of general hospitals. Here the medically indigent are examined and treated if infected. Here too the work of contact investigation begins with the all-important interview, which is conducted by specially trained public health nurses and in a few clinics by trained medical social workers. On these interviews depends the outcome of the contact investigation.

The Department reimburses these hospitals and clinics for the maintenance and operation of the venereal disease clinics in accordance with the high standards set by the Division of Venereal Diseases. Each of the clinics has a chief in charge who is a physician particularly trained in the clinical aspects of venereal disease. Therefore, he assumes the responsibility for the clinical management of all patients in

that clinic. He is assisted by one or more physicians in accordance with the size and case load of the clinic. In addition to the physicians, the clinic has a number of clinic nurses. Social workers are available either on a full-time or part-time basis, in accordance with the clinic's case load. There are three clinics in which no social worker is employed. These clinics use the social worker in the District Health Office to perform the social service work requested by the clinic chief.

One of the key individuals in the cooperating clinic team is the epidemiologist, who interviews all patients for pertinent contacts and brings these latter individuals to the clinic for diagnostic work-up and treatment if infected. However, if the contact prefers to go to a private physician, arrangements are made to furnish this physician with all pertinent data so that he may be on a particular watch for that disease to which the contact was exposed. Our epidemiologists, for the most part, are graduate registered nurses who have had considerable training in generalized public health nursing and specialized training in venereal disease control. Interviewing and contact tracing require specific talents, such as tact and understanding, being able to win the confidence of patients, yet being sufficiently forceful to impress patients to develop good social attitudes, particularly towards sex. These nurses must also possess perseverance, ingenuity, and initiative in order to carry out the primary functions of interviewing and investigation.

The epidemiologist working from a cooperating clinic covers a specific area, and all patients and contacts residing within her area are her responsibility. Thus, the epidemiologist is not only responsible for the follow-up of patients and contacts living in her district and originating from her clinic, but she also does the follow-up of any contact or person living in her district but originating from any other clinic within the state or from out of state.

In Metropolitan Boston, the organization of epidemiological services has been modified because of the larger case load and the fact that clinic sessions are held more frequently, and in some hospitals morning as well as evening clinics are in session. Thus, each of the venereal disease clinics in Boston is headed by a specialized public health nurse who is called the Clinic Executive. She directs all aspects of the clinic, including contact interviewing. The investigations are carried out by five nurse epidemiologists. Each epidemiologist has an office in one of the Boston clinics and has an assigned district. Like her co-worker outside of the metropolitan area, she visits patients, contacts, and suspects located in her district regardless of the hospital to which the patient has reported or irrespective of the origin of the contact or suspect report. In addition to contact investigation, the epidemiologist in the Metropolitan Boston area also interviews military patients for contacts.

## Résumé of Activities

The past seven years were marked by many changes in the administrative, clinical, and public health practices of the Division in keeping with modern venereal disease control activities. One year prior to this report, the Division staff prepared a new epidemiological and lapsed case report. Hand in hand with these new forms and a prerequisite to their proper completion was the development of standards for interviewing and describing contacts of patients with venereal diseases. Following this, changes had to be made in the morbidity reporting system. Beginning with the state cooperating venereal disease clinics, where the bulk of reported cases came, dual-purpose I.B.M. cards were designed to serve as registration cards for the clinics as well as disposition or morbidity report forms. At the same time, a central registry file was developed for the Division of Venereal Diseases and one similar, but on a lesser scale, for the State cooperating clinics.

From fiscal 1951 to 1953, experience was gained with the new morbidity forms for the clinics, and on the basis of this experience a new morbidity report form for private physicians and institutions was put into effect in February, 1953.

PATIENT CLINIC NO. | DATE OF FIRST VISIT THIS ADMISSION | LAST NAME | FIRST | MIDDLE

REPORTING AGENCY

AGE

SEX ☐ M ☐ F

COLOR ☐ W ☐ C ☐ Y ☐ O

MARITAL STATUS ☐ S ☐ M ☐ W ☐ D ☐ SEP

OCCUPATION

SCHOOLING (CIRCLE HIGHEST GRADE COMPLETED)
1 2 3 4 5 6 7
8 9 10 11 12 13+

REASON FOR COMING TO CLINIC (CHECK ONE)

☐ CONTACT

☐ SUSPECT
- ☐ ROUTINE BLOOD
- ☐ INDUSTRIAL
- ☐ PREMARITAL
- ☐ PRENATAL
- ☐ BLOOD DONOR
- ☐ OTHER _____ SPECIFY

☐ VOLUNTARY

☐ ANNUAL CHECK UP

☐ REFERRED BY: L.MD. INST. B of H. COURT. OTHER _____ (SPECIFY)

ADDRESS

DISEASE
- ☐ GONORRHEA
- ☐ SYPHILIS
- ☐ CHANCROID
- ☐ GRANULOMA INGUINALE
- ☐ LYMPHOGRANULOMA VENEREUM

JBR 690828

## REGISTRATION CARD

PREPARE THIS CARD AT TIME OF PATIENT'S FIRST VISIT TO CLINIC AND SEND IMMEDIATELY TO THE

MASSACHUSETTS DEPARTMENT OF PUBLIC HEALTH
DIVISION OF VENEREAL DISEASES
ROOM 546 STATE HOUSE
BOSTON 33, MASS.

MASS. PUB. HLTH. V.D. CARD NO. 1 1954

PATIENT CLINIC NUMBER | DATE OF DIAGNOSIS OR DISPOSITION | LAST NAME | FIRST | MIDDLE

| RESULT OF DIAGNOSTIC OBSERVATIONS | DISEASE AND STAGE | PREVIOUS THIS INFECTION | PREVIOUS & ADEQUATE | NUMBER OF CONTACTS OBTAINED | REMARKS |
|---|---|---|---|---|---|
| ☐ NOT INFECTED | ☐ SYPHILIS | | | | |
| ☐ INFECTED → | ☐ PRIMARY | | | | |
| | ☐ SECONDARY | | | | |
| | ☐ EARLY LATENT | | | | |
| ☐ TRANSFERRED TO | ☐ LATE LATENT | | | | |
| SPECIFY | ☐ NEURO | | | | |
| | ☐ OTHER LATE (SPECIFY) | | | | |
| ☐ LOST TO FOLLOW UP | ☐ CONGENITAL | | | | |
| ☐ ON SUSPICION | ☐ GONORRHEA | | | | |
| | ☐ CHANCROID | | | | |
| ☐ OTHER (SPECIFY IN REMARKS) | ☐ GRANULOMA INGUINALE | | | | |
| | ☐ LYMPHOGRANULOMA VENEREUM | | | | |

SIGNED _____ M.D.

CLINIC: _____

JBR 847202

HOLD THIS CARD IN FILE UNTIL A DECISION HAS BEEN MADE ON THIS PATIENT AND THEN RETURN IMMEDIATELY TO THE

MASSACHUSETTS DEPARTMENT OF PUBLIC HEALTH
DIVISION OF VENEREAL DISEASES
ROOM 546 STATE HOUSE
BOSTON 33, MASS.

MASS. PUB. HLTH. V.D. CARD NO. 2 1954

CONFIDENTIAL G. L., CHAPTER 111, SECTION 119

## MASSACHUSETTS DEPARTMENT OF PUBLIC HEALTH
## REPORT OF A CASE OF VENEREAL DISEASE

NAME OF PATIENT _____ AGE (OR DATE OF BIRTH) _____
(OR INITIALS OR CASE NUMBER)

STREET (IF NAME GIVEN ABOVE) _____ DATE OF DIAGNOSIS _____

CITY OR TOWN _____ SEX: ☐ MALE ☐ FEMALE
MARITAL STATUS: ☐ SINGLE ☐ MARRIED ☐ WIDOWED ☐ DIVORCED ☐ SEPARATED

OCCUPATION _____ RACE: ☐ WHITE ☐ COLORED ☐ OTHER

### SYPHILIS

☐ PRIMARY
☐ SECONDARY
☐ LATENT ☐ EARLY ☐ LATE
☐ LATE ☐ NEURO ☐ CARDIOVASCULAR ☐ MUCOCUTANEOUS ☐ OTHER
☐ CONGENITAL

POSITIVE TESTS
☐ DARKFIELD
☐ BLOOD
☐ SPINAL FLUID
☐ OTHER (SPECIFY)

### GONORRHEA

| | POSITIVE TESTS |
|---|---|
| ☐ GENITOURINARY | ☐ SMEAR |
| ☐ EYE | ☐ CULTURE |
| ☐ OTHER | ☐ OTHER |

### OTHER VENEREAL DISEASES

| | POSITIVE TESTS |
|---|---|
| ☐ CHANCROID | ☐ DUCREY SKIN TEST |
| ☐ GRANULOMA INGUINALE | ☐ SMEAR OR BIOPSY |
| ☐ LYMPHOGRANULOMA VENEREUM | ☐ FREI SKIN TEST |

HAS PATIENT HAD PREVIOUS TREATMENT FOR THIS INFECTION? ☐ YES ☐ NO IF YES, ☐ ADEQUATE ☐ INADEQUATE

ORDER SUPPLIES HERE NUMBER

REPORT BLANKS _____ SIGNED _____ M. D.

LITERATURE FOR PATIENTS _____ STREET _____

LITERATURE FOR PHYSICIANS _____ CITY OR TOWN _____ DATE _____

**ALL VENEREAL DISEASE PATIENTS HAVE CONTACTS. HAVE YOU INTERVIEWED FOR CONTACTS?**

(OVER)

CONFIDENTIAL, G. L., CHAPTER 111, SECTION 119

**USE THIS SIDE OF FORM TO REPORT THE FOLLOWING**

CHECK ONE

☐ CONTACT
☐ PATIENT HAD POSITIVE TEST FOR SYPHILIS AND DID NOT RETURN
☐ PATIENT PREMATURELY DISCONTINUED TREATMENT FOR_____ DATE OF LAST VISIT_____

NAME OF CONTACT OR PATIENT_____
STREET _____ AGE _____
CITY OR TOWN_____ SEX _____
OCCUPATION_____ PLACE OF EMPLOYMENT_____ MARITAL STATUS_____

FOLLOWING INFORMATION FOR **CONTACTS** ONLY:

CONTACT OF

☐ SYPHILIS
☐ PRIMARY
☐ SECONDARY
☐ EARLY LATENT
☐ OTHER (SPECIFY)
☐ GONORRHEA
☐ CHANCROID
☐ GRANULOMA INGUINALE
☐ LYMPHOGRANULOMA VENEREUM

RELATIONSHIP TO PATIENT:
☐ MARITAL ☐ FRIEND ☐ PICKUP ☐ PROSTITUTE ☐ OTHER

WILL YOU LOCATE AND EXAMINE THIS CONTACT? ☐ YES ☐ NO

IF NOT, THE DIVISION STAFF WILL ASSIST IN LOCATING AND REFERRING CONTACT FOR MEDICAL EXAMINATION

OTHER INFORMATION HELPFUL IN LOCATING CONTACT:_____

**PATIENTS USUALLY HAVE SEVERAL CONTACTS.**
**PLEASE USE SEPARATE FORM FOR EACH CONTACT.**

PH-VP-13. 35M 6-53-909600

## State Cooperating Venereal Disease Clinics

There were twenty-four state cooperating venereal disease clinics, but on July 1, 1953 one was eliminated, leaving a balance of twenty-three clinics, which are operating up to the present time. Standards for the diagnosis and treatment of the venereal diseases were developed with the help of the advisory committee composed of the clinic chiefs. The first of the standards were published on June 9, 1949 and were amended over the years as newer and more effective methods of treatment were announced. The latest standard for the diagnosis of syphilis was published in June, 1956.

Early in this period the Division prepared frozen malarial blood for the treatment of parenchymatous neurosyphilis, but as time went on and when penicillin was demonstrated to be equally as effective as combined penicillin and malaria, the frozen malarial blood treatment was discontinued.

In the meantime, the Division published quarterly the *Bulletin of Venereal Diseases,* which dealt with some phases of the clinical problem of these diseases.

About 20 per cent of the venereal disease control problem in Massachusetts represents military cases, and in 1951 our military control program was intensified. Through the Armed Forces Disciplinary Control Board, the Director, as their civilian advisor, recommended and received their approval for more effective interviewing procedures. Beginning with Camp Devens, the nurse epidemiologists were assigned to all military installations in Massachusetts to interview military patients with venereal diseases. This cooperative venture resulted in benefits both to the military and civilian communities. In June, 1951 the Director was awarded a citation for his work with the Armed Forces Disciplinary Control Board.

The Division of Venereal Diseases was responsible also for the investigation of draftees as well as separatees discovered to have a positive blood test for syphilis or other signs of venereal diseases.

## Premarital Examination Law

For the past seven years the Division has been tremendously interested in the development of a medical reciprocity between the states insofar as the premarital medical examination is concerned. Thus, if a resident of Massachusetts wishes to be married in another state, he or she may visit his or her private physician for a blood test, which is performed at the State Laboratory. Then the doctor completes the Massachusetts medical certificate, which will be honored by the other State. Similarly, the certificates of other states will be honored by Massachusetts under similar conditions. At the present time, there are 40 states and three territories which have premarital examination laws. Massachusetts will accept the certificates of 36 of these states, and two of the three territories. There are four Canadian provinces which also have premarital examination laws. Massachusetts will accept the certificate of one of them. In return, there are 19 states and two territories which have agreed to accept the Massachusetts premarital certificate when properly completed. It is our plan to establish mutual reciprocity arrangements with all states having such laws.

In conjunction with our program for a better understanding of the Massachusetts Premarital Examination Law by our State residents and doctors, two pamphlets were prepared. The first one was published in the *American Journal of Social Hygiene*, January, 1953, entitled "Marriage and the Law — Medico-legal Requirements in Massachusetts," and it was specifically designed to assist doctors, marriage registrars, and clergymen to answer questions which are frequently asked of them. The second pamphlet is entitled "Planning Your Marriage" and was designed for lay consumption. Supplies are kept by marriage registrars and are given to those who ask questions about the marriage law.

## Prenatal Syphilis Study

In June, 1951 the Division of Venereal Diseases undertook a prenatal syphilis study. The purpose of this program, which continues to the present day, is to answer five major questions:

(1) What is the incidence and prevalence of prenatal syphilis at the hospitals under study?

(2) How many women develop syphilis during pregnancy subsequent to the initial negative prenatal blood test?

(3) At what month during pregnancy is the prenatal blood test taken for patients delivering at a large hospital?

(4) How many women delivering at a large hospital have no prenatal blood test taken at all?

(5) To what degree will anesthesia influence the blood test?

Up to the present time 27,580 pregnancies have been tabulated on I.B.M. cards for analysis. It is expected that this study will continue for another five years.

## Education

A well-informed staff is essential to any program. In the field of venereal diseases, it is of paramount importance because of the intimate and delicate nature of the work. Therefore, the staff education program is planned in August of each year; it consists of monthly meetings of two hours each from October to June, inclusive. The first hour is taken up with a discussion of some phase of venereal disease control from either a clinical or public health aspect, and a guest speaker is invited for this part of the meeting. The second hour is spent in a discussion of the problems arising during the previous month. The staff education program was initiated in 1949 and has not only been effective in improving the caliber of the work, but has also brought about the closer integration of the field staff.

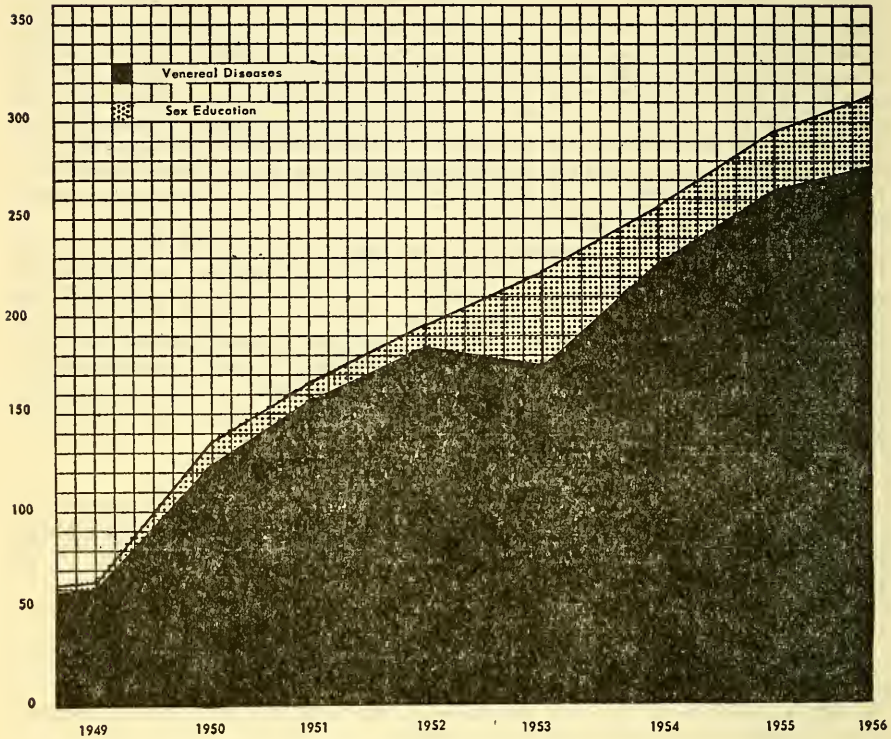
In 1949 the Division launched an educational program among schools of nursing after a preliminary survey indicated that this subject was neglected in the nursing curriculum. A six-hour course on the Clinical and Public Health Aspects of the Venereal Diseases was prepared and offered to them (Graph 1).

Graph 1

MASSACHUSETTS DEPARTMENT OF PUBLIC HEALTH, DIVISION OF VENEREAL DISEASES

LECTURE HOURS GIVEN IN SEX EDUCATION AND VENEREAL DISEASES

1948 - 1956




Field training courses in venereal disease control were offered at a graduate nurse level, and each year about 12 nurses take our eight-week field training course.

A film library was created, and in fiscal 1955 there were 452 showings, primarily in schools of nursing. Complementing the film library, literature on the venereal diseases was compiled.* During the last fiscal year 24,580 pieces of literature were distributed.

During the past seven years the lowest reported number of patients with syphilis occurred in 1950, and an increase took place every year thereafter. In May, 1955 cases of primary and secondary syphilis increased in steplike fashion, continuing through the entire year. These seven years have seen the decline in syphilis, and beginning with 1951 its resurgence. Present-day control methods will not eradicate the venereal diseases, since they are designed only to reduce them. Our methods of control are not geared and by their very nature will not eradicate these diseases. Therefore, the objective of the Venereal Disease Control Program is to reduce them to their irreducible minimum. The venereal diseases are spread essentially through sexual promiscuity, but the problem of sexual promiscuity has as yet to be solved. There will always be an infectious reservoir of venereal disease in the community. The sexual mores of our people will determine whether this reservoir is to increase or decrease. If control efforts are relaxed, and the present level of sexual promiscuity persists, one can easily predict epidemics of these diseases in the future.

*This literature can be obtained from the Division of Venereal Diseases.

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# BUREAU OF INSTITUTE OF LABORATORIES

## DIVISION OF BIOLOGIC LABORATORIES

On April 2, 1951 the Biologic Laboratories joined with the Diagnostic Laboratories to form the Institute, with Dr. Johannes Ipsen, Jr., Associate Professor, Harvard School of Public Health, as Superintendent. Thus, after a period of almost 60 years, the Department came back to the prototype established under the able leadership of Dr. Theobald Smith. Diagnostic services and research were then the natural outgrowths of his early work in this new field of biologic preparation.

On July 22, 1949, Dr. Geoffrey Edsall resigned as Director. Dr. James A. McComb was appointed Acting Director. He has continued as the responsible head of the laboratories, assuming the directorship in 1955.

Expansion in the number of different biologics prepared, in physical resources, including a new second-story addition to the Blood Laboratory, and greatly increased distribution marked the period which this report covers. During the same period a rapid turnover in personnel, coupled with an inability to attract highly qualified individuals to fill certain staff vacancies, has resulted in understaffing which could be dangerous. The existing inflationary spiral, if it continues much longer, can most certainly undermine key staff positions which form the foundation upon which such laboratories are constructed.

Research, particularly in the field of diphtheria prophylaxis and prophylactics, has resulted in methods which promise to be useful in succeeding years. "Serologic" epidemiology has given results which are both encouraging and disquieting. By doing antibody titrations on sera from discarded Wassermann specimens and other studies, it has been shown that a high level of immunity to diphtheria and tetanus exists in the lower age groups. This, coupled with the recent precipitous drop in the incidence of whooping cough, seems to point to the effectiveness of "Diphtheria and Tetanus Toxoids and Pertussis Vaccine, Combined, Aluminum Phosphate Precipitated." Disquieting is the low level of immunity to diphtheria found in the adult population. A study product, "Tetanus and Diphtheria Toxoids, Combined, for Adult Use" has had a modest distribution since 1954. Its increased use is much indicated.

The control testing of human blood fractions under the Cohn patents administered by the Research Corporation of New York City came to an end in 1952. The Research Corporation turned the patents back to Dr. Cohn and this work was taken over by the newly organized Protein Foundation.

### Antitoxin and Vaccine Laboratory

Working with new methods and equipment, a greatly improved smallpox vaccine has been in distribution since 1950. This vaccine is more potent and almost completely free of bacterial contaminants.

The product introduced in 1950 which has had the greatest distribution of any product manufactured by the laboratories is "Diphtheria and Tetanus Toxoids and Pertussis Vaccine, Combined, Aluminum Phosphate Precipitated." Figure 1 shows the number of individual doses distributed annually.

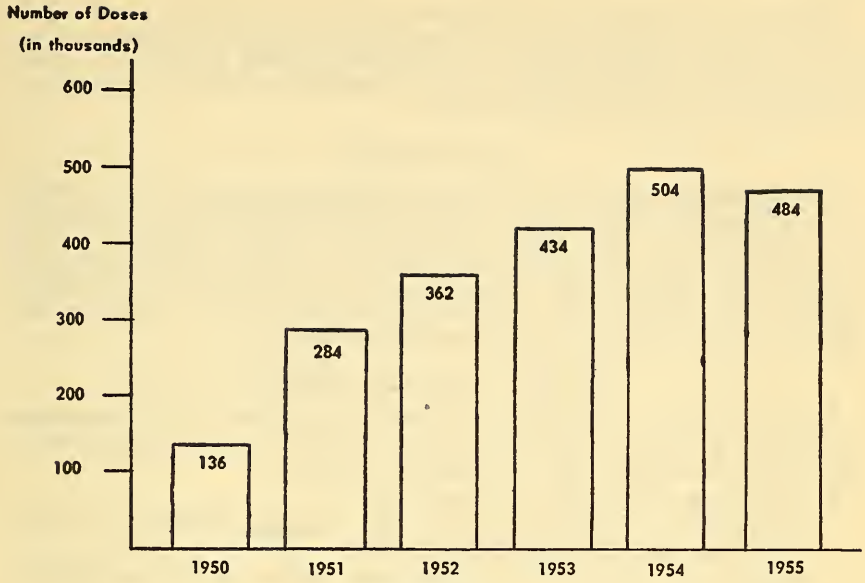


FIGURE 1
Annual Distribution of Doses

A ready-to-use diluted tuberculin has been in distribution since 1951 and is gradually replacing the Tuberculin, Old, which requires dilution before use. Another advantage of this product has been that it has discouraged the use of the higher strength dilution of tuberculin which, it is felt, does not lend itself to accurate diagnosis in this area.

The trend has been toward greater purity in such products as diphtheria and tetanus toxoids and pepsin-digested antitoxin. A critical biological test has been devised for determining the extent of the purity of tetanus antitoxin; it correlates well with the reactions or lack of them when the material is used prophylactically.

## BLOOD LABORATORY

There have been many changes in this laboratory. In 1950 the American Red Cross assumed complete responsibility for the whole blood program formerly operated by the State. Laboratory pilot studies financed by the Red Cross were terminated in 1951. In that year three types of services were begun for the Red Cross on a contract basis, namely (1) plasma separation for the local Red Cross Blood Center, (2) irradiated plasma preparation and distribution, and (3) plasma fractionation for the American National Red Cross. The local center took over its own plasma separation in 1954. Due to a study showing the inability of irradiation to destroy the hepatitis virus in plasma, the American Red Cross suspended this work in 1953. Work continues in Red Cross plasma fractionation under annual contract.

Through the interest taken by the Massachusetts Medical Society and, in turn, the hospital blood banks, increasing amounts of plasma from human bloods, outdated for use as whole blood, have become available for fractionation into albumin and globulin. The albumin is returned to the participating hospitals and the globulin is used, together with Red Cross allotments to the State, for prophylaxis in measles and infectious hepatitis.

Working with Dr. Dwight Mulford, a former assistant director, the laboratory has been producing pilot lots of Fibrinogen-Free Low Globulin Plasma since 1955. The two chief advantages of this material over plasma are: (1) It will withstand 60°C. for 10 hours without significant change. This process should kill any hepatitis virus present. (2) Immune Serum Globulin is obtained as a by-product.

While civil defense demands participation of our entire resources, because of the yeoman work of the civil defense blood committee, the bulk of the planning and work has been in connection with emergency blood, blood substitutes, and fluid replacements. Throughout the life of this committee the laboratories have been represented by two or three staff members.

### Special Services

The increasingly wide variety of such services begs coverage by a short description. Distribution of Poliomyelitis Immune Globulin and later that of vaccine for the 1954 field trials for the National Foundation for Infantile Paralysis were the most time-consuming. Furnishing various blood fractions, purified diphtheria antigens, and cultures of high toxin-producing bacterial strains to investigators world-wide is considered to be a part of the contribution which we should always strive to make in the furtherance of knowledge in these fields.

### National Institutes of Health

Operating under U. S. License No. 64 since 1917, the name of the laboratories was changed in 1951 by the National Institutes of Health for licensing purposes to the Massachusetts Public Health Biologic Laboratories.

New licenses granted during this period were:

Diphtheria and Tetanus Toxoids and Pertussis Vaccine, Combined, Aluminum Phosphate Precipitated, 1950.

Diphtheria and Tetanus Toxoids, Combined, Aluminum Phosphate Precipitated, 1950.

Tetanus Antitoxin, 1950.

Poliomyelitis Immune Globulin, 1953.

TABLE I — *Distribution of Products*

| | 1950 | 1951 | 1952 | 1953 | 1954 | 1955 |
|---|---|---|---|---|---|---|
| *Diphtheria* | | | | | | |
| Antitoxin, 1000 unit doses | 35,661 | 23,558 | 21,684 | 17,758 | 12,583 | 8,416 |
| Schick Outfits, 50 doses each | 3,672 | 3,256 | 2,511 | 2,781 | 2,071 | 2,352 |
| Toxoid, 1 cc. doses | 69,313 | 39,359 | 200 | – | – | – |
| Toxin (bulk cc.) | 2,117 | 1,770 | 1,090 | 1,200 | 1,415 | 1,120 |
| Antitoxin (bulk cc.) | 175 | 520 | 150 | 310 | 200 | 581 |
| Diphtheria-Tetanus (cc.) | 10,977* | 61,387.5 | 79,527 | 77,404.5 | 81,157.5 | 75,719 |
| Diphtheria-Tetanus-Pertussis | 68,379 | 142,216.5 | 181,981.5 | 217,806 | 252,210 | 242,127 |
| Diphtheria Toxoid (cc.) | 83,745 | – | 255 | 646 | 1,495 | 1,100 |
| Diphtheria-Tetanus-Paratyphoid (cc.) | – | – | – | 246 | 16.5 | – |
| *Enteric Fevers* | | | | | | |
| Typhoid Vaccine (cc.) | 14,672 | 8,180 | 7,242 | 6,476.5 | 6,635.5 | 14,933 |
| Typhoid and Paratyphoid Vaccine (cc.) | 77,628 | 73,606 | 77,382.5 | 69,110 | 68,755.5 | 98,435.5 |
| *Measles* | | | | | | |
| Immune Serum Globulin (cc.)† | 44,944 | 54,224 | 115,344 | 48,310 | 181,223 | 129,106 |
| *Meningitis* | | | | | | |
| Antihemophilus Type B serum (vials) | 23 | 20 | 1 | 8 | – | – |
| *Smallpox* | | | | | | |
| Smallpox Vaccine, capillary tubes | 244,757 | 260,943 | 279,253 | 286,773 | 297,927 | 303,518 |
| Needles | 75,710 | 81,890 | 93,700 | 103,090 | 112,880 | 114,020 |
| *Tetanus* | | | | | | |
| Antitoxin (vials) | – | 2,400 | 3,640 | 5,485 | 8,504 | 11,844 |
| Toxoid (cc.) | 42,483 | 63,147 | 57,897 | 61,271 | 67,813 | 84,268 |
| Antitoxin, bovine (5 cc. vials) | – | – | – | 2 | 3 | 4 |
| Tetanus-Diphtheria Toxoid (cc.) | – | – | – | – | 1,167 | 4,347 |
| *Tuberculosis* | | | | | | |
| Tuberculin, ampoules (0.7 cc.) | 1,247 | 947 | 749 | 601 | 679 | 524 |
| Tuberculin, capillary tubes | 4,045 | 2,920 | 2,840 | 2,105 | 2,055 | 1,460 |
| Diluted Tuberculin, 1 : 1000 (cc.) | – | 374 | 1,996 | 3,826 | 5,010 | 12,912 |
| *Gonorrheal Ophthalmia* | | | | | | |
| Silver Nitrate, ampoules | 119,958 | 127,500 | 127,018 | 113,478 | 123,246 | 136,374 |

TABLE I — *Distribution of Products — Continued*

| | 1950 | 1951 | 1952 | 1953 | 1954 | 1955 |
|---|---|---|---|---|---|---|
| *Syphilis* | | | | | | |
| BAL | – | 1 | – | – | 1 | – |
| Bismuth, Salicylate in oil, 12 cc., 30 cc., and 60 cc. bottles | 884 | 595 | 222 | 235 | 230 | 137 |
| Chlorasen, vials of 0.045, 0.067, 0.45 and 0.67 gm. | 770 | – | – | – | – | – |
| Ducrey Vaccine (0.2 cc. vials) | 10 | 20 | 7 | 15 | 22 | 15 |
| Lygranum, 1 and 10 test units | 41 | 32 | 50 | 52 | 50 | 51 |
| Mapharsen, 0.04, 0.06 and 0.6 gm. amps. | 5,700 | 3,750 | 1,610 | 970 | 900 | 990 |
| Penicillin, vials of 100,000, 200,000, 300,000, 500,000, 1,500,000 and 3,000,000 u. | 5,016 | 3,861 | 3,593 | 2,743 | 2,535 | 3,487 |
| *Red Cross Contract Distribution* | | | | | | |
| Poliomyelitis Immune Globulin (cc.) | – | – | – | 50,764 | 156,062 | 36,148 |
| Immune Serum Globulin (cc.) | – | – | – | 5,226 | 16,458 | – |
| Normal Serum Albumin (100 cc. vials) | – | – | – | – | 183 | 3,398 |
| *Transfusion Therapy* | | | | | | |
| Exchange blood (bottles) | 18 | – | – | – | – | – |
| Whole Blood (pint bottles) | 5,401 | – | – | – | – | – |
| Red Cells (bottles of various sizes) | 38 | – | – | – | – | – |
| Normal Serum Albumin (20 cc. bottles) | 107 | 229 | 374 | 87 | – | – |
| Normal Serum Albumin (100 cc. bottles) | 502 | 399 | 465 | 694 | 1,344 | 2,389 |
| Human Plasma (cc.) | – | 354,600 | 2,491,800 | 282,300 | 100,500 | – |
| Fibrinogen (bottles) | 2 | – | – | – | – | 11 |
| Frozen Malarial Blood (cc.) | 67 | 18 | – | – | – | – |
| Fibrin-Free Low Globulin Plasma (cc.) | – | – | – | – | 11,000 | 40,100 |
| *Whooping Cough* | | | | | | |
| Pertussis Vaccine (cc.) | 30,455 | 23,730 | 24,480 | 17,080 | 13,120 | 13,635 |
| Conc. Antihemophilus Pertussis Rabbit Serum (vials) | 45 | 48 | 47 | 71 | 105 | 75 |
| *Miscellaneous Other Products* | | | | | | |
| Antihemophilus Influenza Serum, rabbit typing, cc. | – | – | – | 106 | 69 | – |
| Citrated horse blood (cc.) | – | – | – | 6,000 | – | 36,000 |
| Defibrinated horse blood (cc.) | 444,950 | 445,855 | 498,930 | 525,700 | 576,540 | 602,150 |
| German Measles Immune Globulin (cc.) | – | – | 418 | 174 | 60 | – |
| Normal Horse Serum (cc.) | 50,950 | 55,905 | 56,600 | 59,835 | 59,040 | 99,300 |
| Serum Sensitivity Outfits — Horse | 611 | 916 | 780 | 652 | 909 | 1,001 |
| Serum Sensitivity Outfits — Rabbit | 25 | 20 | 17 | 53 | 75 | 53 |

*End of EMIC distribution and beginning of own manufacture.
†Furnished in part by the American Red Cross.

## DIVISION OF DIAGNOSTIC LABORATORIES

### Diagnostic Laboratory

Increase in the amount and types of work these laboratories have performed marks the period covered by this report. The diagnosis of enteric pathogens such as the Salmonella is noteworthy in this respect. The wisdom of the earlier establishment of the Virus Laboratory was confirmed during the 1955 epidemic of poliomyelitis in Massachusetts. Another much neglected field, diagnosis and research in the pathogenic fungi, was entered in 1953. Gratifying progress has been made with this small beginning and improvements in methodology have been made.

Workshop and refresher courses for hospital technologists have been offered by the laboratories and they have been well received by hospital personnel.

New methods have been investigated for diagnostic aids in those individuals giving apparently false-positive Hinton tests.

The Diagnostic Laboratory is badly in need of an increased number of professional workers, a condition which has resulted largely from the unprecedented increase to 10-fold in the number of Salmonella recoveries since the low year of 1950, as pictured in Figure 2. In the same period the total annual samples and enteric pathogens showed an overall increase of only about 50 per cent.

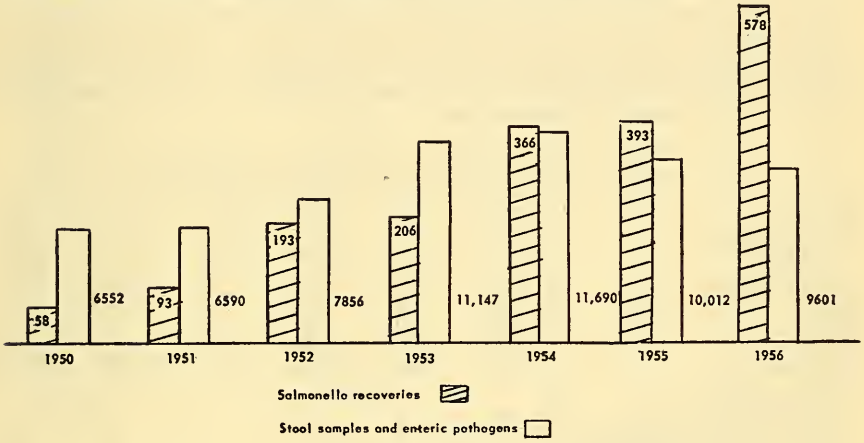


Figure 2
Salmonella Recoveries, 1950–1956

The building in which the Diagnostic Laboratories are housed is antiquated and inadequate, necessitating as it does the quartering of the virus laboratory and the research mycology laboratory in other buildings. A modern, new building is urgently needed.

### Bacteriological Laboratory

Several important new activities have been added. First, in the enteric pathogens section, all stools of cases where the age is designated as two years or less are now screened for pathogenic *Escherichia coli*. This procedure is an important addition, since it has recently been shown that certain strains of *E. coli* can cause severe or even fatal illnesses in the very young. Next, in the diagnostic tuberculosis section, cultures as well as smears are now included on all cases, whether specifically requested by the physician or not, in keeping with present-day procedures recommended for the laboratory diagnosis of tuberculosis. Including cultures as well as smears on all suspected cases increases the diagnostic sensitivity of the laboratory work.

A mycology service was begun in 1953. The work in the Diagnostic Laboratory building has been confined to diagnostic work. In 1956 a new position was created, making possible operation by the Commonwealth of the research mycology labora-

tory near the Biologic Laboratories, which was formerly operated under a grant received by Harvard University. In addition to its investigative work, the research mycology laboratory has cooperated with the Diagnostic Laboratory by screening for pathogenic nocardia the atypical acid-fast cultures recovered from specimens sent to the Diagnostic Laboratory for testing for tubercle bacilli.

For several years the Diagnostic Laboratory was in active administrative and technical charge of a Civil Defense mass blood typing program. Over 300,000 persons in the Commonwealth had their bloods typed by mobile blood typing teams and were issued blood typing identification cards to carry on their persons. Before the program was given up for lack of funds, a small pilot training program for volunteer blood typers was carried out successfully.

The Virus Laboratory, which began very modestly in 1948, expanded rapidly in the 1955 summer of high poliomyelitis prevalence in Massachusetts, and was able to perform important diagnostic services in the identification of poliomyelitis viruses from stools and the titration of serums for poliomyelitis antibodies, which aided greatly in the epidemiological investigation of the outbreak. Aided by a contract with the Communicable Disease Center, and funds from the National Foundation for Infantile Paralysis, quite adequate equipment has been secured and the laboratory has become a very satisfactory operating unit. It is hampered, however, by insufficient space in spite of an additional room made available by Harvard Medical School, in the buildings of which the laboratory is located.

The laboratory approval program has continued to grow. It has effectively expanded its services from time to time by offering workshop and refresher courses for the hospital technologists desiring to attend, especially courses in the laboratory diagnosis of bacterial enteric pathogens.

TABLE I — *Numbers and Kinds of Specimens*

| | 1950 | 1951 | 1952 | 1953 | 1954 | 1955 |
|---|---|---|---|---|---|---|
| Agglutinations | 6,073 | 5,469 | 5,255 | 5,604 | 5,366 | 6,041 |
| Blood Typing Tests: | | | | | | |
| Prenatal | 16,981 | 25,312 | 26,619 | 28,033 | 24,668 | 24,019 |
| Civil Defense | – | – | – | 204 | 24 | 264 |
| Enteric Pathogens | 6,552 | 6,590 | 7,856 | 11,147 | 11,690 | 10,012 |
| Gonorrhea | 5,266 | 5,940 | 3,900 | 3,748 | 3,841 | 3,345 |
| Malaria | 89 | 77 | 62 | 59 | 30 | 26 |
| Pneumonia | 49 | 45 | 34 | 12 | 33 | – |
| Throat Cultures | 5,066 | 4,448 | 4,229 | 3,915 | 3,949 | 5,703 |
| Tuberculosis | 9,216 | 9,040 | 9,040 | 9,160 | 8,682 | 8,356 |
| Vincent's Gingivitis | – | – | – | 92 | 85 | 47 |
| Viral Serological Tests: | | | | | | |
| Cold Agglutinus | 24 | 24 | 23 | 3 | 97 | 176 |
| Influenza A and B, and FM$_1$ | 32 | 126 | 19 | 52 | 34 | 130 |
| Lymphocytic Choriomeningitis | – | – | – | – | 85 | 96 |
| Lymphogranuloma and Psittacosis | – | – | – | – | 107 | 186 |
| Mumps Complement-Fixation Tests and HAI Tests | 360 | 178 | 164 | 228 | 445 | 224 |
| Herpes Simplex | – | – | – | – | 89 | 179 |
| Leptospira | – | – | – | – | 10 | – |
| Heterophile Antibodies | – | – | – | – | 42 | 6 |
| Virus Isolation Attempts: | | | | | | |
| Poliomyelitis, Coxsackie and Echo Viruses | – | – | – | – | – | 226 |
| Miscellaneous | 505 | 456 | 385 | 441 | 563 | 445 |
| Mycology | – | – | – | – | – | 536 |
| Totals | 50,213 | 57,705 | 57,586 | 62,698 | 59,840 | 60,040 |

## WASSERMANN LABORATORY

During the years from 1949 to 1956 the Wassermann Laboratory has been engaged in the usual routine work of testing specimens for syphilis, brucellosis in cattle, and rabies. In this period over 3,300,000 tests were performed. Serologic tests for syphilis comprised approximately 90 per cent of the work load. The intrastate serologic evaluation of 134 laboratories has been carried on annually for those seeking approval to perform tests for premarital, prenatal, and blood donor purposes. Refresher courses on the serology of syphilis have been held periodically.

The laboratory has participated each year in the evaluation of the Hinton test conducted by the United States Venereal Disease Research Laboratory and has maintained its usual high rating for efficiency and accuracy.

During the period from 1949 to 1956 over 1,000 specimens, including many wild animals, have been examined for rabies. All were found negative.

In 1951, due to the curtailment of federal funds, the Wassermann and Kahn tests were discontinued and two junior clerk-typist positions were abolished.

In 1952 total protein and globulin tests on specimens of spinal fluid were added to the routine procedures.

On December 31, 1953 Dr. William A. Hinton, Director of the laboratory since its establishment in 1915, was retired and Miss Genevieve O. Stuart assumed his duties as head of the laboratory.

During 1954 in cooperation with the United States Department of Agriculture a new program of testing blood and milk for the eradication of brucellosis in cattle was initiated.

During 1955 and 1956 in cooperation with the Division of Venereal Diseases experimental work on the Treponema Immune Adherence test and Treponema Pallidum Complement Fixation test was executed in an attempt to determine the feasibility of using one of these techniques as an adjunct to the standard serologic tests on specimens from patients suspected of giving biologic false-positive tests.

TABLE II — *Tests and Examinations*

| KIND OF SPECIMEN | 1950 | 1951 | 1952 | 1953 | 1954 | 1955 |
|---|---|---|---|---|---|---|
| **Blood:** | | | | | | |
| Number of Specimens | 533,398 | 540,953 | 546,801 | 525,075 | 529,927 | 512,817 |
| Tests: | | | | | | |
| Hinton | 479,986 | 494,766 | 492,224 | 474,553 | 473,048 | 478,422 |
| Rapid Hinton | 7,243 | – | – | – | – | – |
| Hinton Titr.— Penicillin | 14,115 | 7,430 | 9,230 | 8,454 | 10,075 | 10,642 |
| Kahn Titr.— Penicillin | 13,529 | – | – | – | – | – |
| Davies - Hinton Micro | 14,147 | 13,991 | 13,563 | 12,437 | 11,564 | 8,987 |
| *Brucella Abortus Agglutination | 24,895 | 24,755 | 31,776 | 29,633 | 35,539 | 14,756 |
| *Glanders | 11 | 15 | 8 | 7 | 13 | 10 |
| **Spinal Fluid:** | | | | | | |
| Number of Specimens | 11,057 | 9,974 | 10,336 | 9,767 | 9,369 | 8,914 |
| Tests: | | | | | | |
| Wassermann | 8,033 | – | – | – | – | – |
| Davies-Hinton | 11,057 | 9,974 | 10,336 | 9,767 | 9,369 | 8,914 |
| Globulin | – | – | 859 | 5,032 | 4,675 | 3,583 |
| Total Protein | – | – | 663 | 4,207 | 4,184 | 3,710 |
| **Rabies Diagnosis*:** | | | | | | |
| Number of Specimens | 189 | 168 | 156 | 182 | 216 | 167 |
| Tests: | | | | | | |
| Impressions | 189 | 168 | 156 | 182 | 216 | 167 |
| Sections | 181 | 158 | 149 | 172 | 199 | 152 |
| Animal Inoculations | 185 | 167 | 151 | 174 | 212 | 159 |
| **Total Tests** | 573,571 | 551,424 | 559,115 | 544,618 | 554,094 | 529,502 |
| **Total Specimens** | 544,644 | 551,095 | 557,293 | 535,024 | 539,512 | 521,898 |

*Diagnostic Examinations for Division of Livestock Disease Control.

# BUREAU OF HOSPITAL FACILITIES

## DIVISION OF HOSPITAL FACILITIES

### Licensure

Improvement in the quality of patient care in hospitals and related facilities may be achieved by a variety of methods. In Massachusetts and other states, joint committees representing state hospital associations and medical societies have been established for this purpose. Better patient care is, of course, the ultimate goal of every hospital's medical, nursing and administrative staff. By the same token, accreditation by the Joint Commission on Hospital Accreditation is evidence that the approved institution has complied with a set of standards adopted by the representative national agencies which make up this agency. Similarly, the licensing program of the Massachusetts Department of Public Health has, as its primary purpose, improved medical care for the patient.

Since 1941, when our licensing program was established, there have been two major revisions of the regulations or standards adopted to implement the licensure law. As the standard of care in Massachusetts hospitals has improved, there has been a gradual but constant upgrading of our hospital regulations. The last such revision occurred in 1950, and it is proposed, in this paper, to present the progress in Massachusetts which has taken place in the institutions of the State since that time.

Although hospital licensure was the primary objective of the program at its inception in 1941, its scope has been broadened gradually to encompass all medical-care facilities within the Commonwealth. Supervision of clinics and dispensaries became the responsibility of the Division of Hospital Facilities in 1944. In 1948, the hospital licensing law was extended to include nursing or convalescent homes and boarding homes for the aged, as public opinion demanded better medical care for all who needed it. Licensure of city and town infirmaries instituted by the Massachusetts Legislature in 1953 was added to the responsibilities of the Division of Hospital Facilities. To conform with national legislative amendments concerning public assistance laws, approval of public medical institutions for the care of old age patients as well as for those with permanent or total disability became an added responsibility of this division in 1953. Similarly, when the use of blood transfusion and of blood derivatives increased in medical practice, approval and certification of blood banks in licensed hospitals became an added feature of the licensure program.

Another significant aspect of the licensure law in Massachusetts is the classification of hospitals. Thus, as new types of medical-care facilities come into existence, they too come under the sphere of the licensing law. Institutions for the care of noncommittable alcoholics may be cited as an example. Such institutions, prior to State licensure, were in existence without being under the supervision of any State or local agency. They were not even required to comply with fire and safety laws. As these institutions were incorporated into the licensing program, improvements in them became inevitable.

Although improvements in facilities and patient care in hospitals have been constant since 1941, the most significant changes have occurred since the 1950 revision of the regulations. The major problems which confronted the staff of the licensing division may be divided into two categories, the first being related to the physical aspect of the hospital plant and the second to medical and nursing care. It is conceded, however, that there is a very close tie between the two.

During World War II and the years immediately following its conclusion, hospital construction, including major alterations, had come to a complete standstill. Physical plants had deteriorated to varying extents. Many hospitals, over the years, had been improvised from private dwellings. Not infrequently the buildings were overcrowded, inadequate in patient and medical service facilities and constituted real fire hazards. Because a large number of our Massachusetts hospitals had been built at the turn of the century, obsolescence became a real problem. A

significant proportion of all hospital beds were contained in non-fire-resistant buildings, considered hazardous by the licensing agency as well as hospital trustees.

Problems presented themselves in all departments of the hospital. Maternity wards were overcrowded and in some hospitals delivery suites were not segregated as required by the accrediting agency, as well as the Department's regulations. There were insufficient labor rooms and overcrowding was apparent in newborn nurseries. In one nursery, for example, located on the top story of a non-fire-resistant building, 76 bassinets for newborn infants were contained in one large area.

Problems were also encountered in surgical departments. Operating rooms were small; floors, electric outlets and equipment in the operating room were not in accordance with the standards aimed at the prevention of explosions. In some instances, surgery was not segregated from other parts of the hospital. Not infrequently, scrub-up and sub-sterilizing areas were inadequate, while the whole operating area was subjected to extremes of temperature, too cold in the winter and too hot in the summer, conditions unfavorable both for personnel and for patients. Overcrowding in kitchens and subsequent lack of sanitation were noted in some hospitals. Many ward kitchens had become obsolete and unsuitable. Utility rooms were sometimes poorly equipped, small and inconveniently located. Patient areas, too, were overcrowded. Beds were very often found in corridors, and in at least two hospitals bassinets and cribs were found in rooms with beds for adult patients.

In some instances, areas designated for laboratory and x-ray departments had not been enlarged, as the rest of the hospital had been expanded and had become hopelessly inadequate. Not infrequently outpatient departments had been added in the basement or in other areas previously used for storage. Such areas constituted poor facilities for outpatient departments and resulted in the loss of usable storage area.

Apart from physical plant, the problems presented themselves in other spheres. Of these, inadequacies in medical records were prominent. Shortages of medical and nursing personnel during the war had lowered the quality of medical records in many hospitals. Having become accustomed to such a pattern, it was extremely difficult to alter such habits. In some instances it was found that large numbers of records had not been completed and tissue and record committees had not been active. This problem was particularly acute in hospitals which, in the past, had not sought accreditation by the American College of Surgeons, the agency then responsible for this function. Shortages in nursing personnel, which had become apparent during and immediately after the war, were aggravated as time went on. To an ever increasing extent, nonprofessional personnel had been utilized in hospitals, sometimes for professional services. Deterioration in nursing technique and care was often the inevitable result. Complaints from patients concerning lack of nursing care in the hospital became very common.

When the Department assumed responsibility for the licensing of nursing homes and boarding homes for the aged, it soon became apparent that this was to be no easy task. Although there were a number of good homes, many were obviously poor. Among the more pressing problems in such homes were shortages of personnel, poor sanitation and patient accommodation, inadequate medical supervision, nursing care, nutrition and equipment. There were those who felt that lack of adequate facilities for rehabilitation was a serious inadequacy in such homes. While this was true in general, it became apparent to the staff of the Division that, since the average age of patients in nursing homes and residents in boarding homes was in the vicinity of 70 years, rehabilitation in the sense of physical restoration for job training and employment was an unrealistic goal.

While there was an acute need for better recreational facilities in these homes, the most urgent need was to improve the environment and to provide for a clean, comfortable home with adequate food, nursing care and freedom from abuse. The achievement of this goal became the immediate objective in this area.

When it was established by study that 60 per cent of the persons in nursing homes and boarding homes were cared for by public assistance and that many better homes could accept but a small proportion of public assistance patients

because of the low rates paid for their care, difficulties in this regard became even greater. If standards were to be pushed too rapidly by the Department of Public Health, greater limitations on the number of public assistance patients would have been imposed by home owners.

When the General Court added the licensing of city and town infirmaries, this soon constituted a considerable portion of the Division's activities. Prior to 1953, the Department of Public Welfare could only make recommendations to local welfare boards regarding these infirmaries. Rarely, if ever, were this Department's recommendations carried out. If the status of nursing and boarding homes in 1948 were to be described as poor, then conditions in city and town infirmaries in 1953, utilizing the same standards, would have to be considered deplorable. It is difficult to put into words the sorry conditions found in many infirmaries. In one such institution, erected early in the nineteenth century, bricks falling from a crumpling wall constituted a hazard not only to the residents of the home but to persons passing by in the neighborhood. In some instances, the Department of Public Safety had refused to issue certificates indicating compliance with minimum standards in regard to fire and egress. In one community the local board of health had made violent protests to the welfare department in regard to the continued occupancy of the local infirmary by human beings. No attention had been paid to the pleas of the board of health, because no licensing law was in effect. Life in many of these institutions may properly be described as bare existence.

In presenting improvements which have occurred in institutions licensed by the Department of Public Health, it must be borne in mind that agencies other than the Division of Hospital Facilities have had similar goals. Hospital trustees have taken an active role in this connection. The Massachusetts Hospital Association, too, has proceeded with its very vigorous program. Furthermore, material improvement has been achieved by the efforts of the Joint Commission on Accreditation. In this connection, it must, however, be pointed out that significant progress in hospitals which have not sought accreditation by the Joint Commission has also been achieved. It would appear that the Joint Commission has been devoting considerable effort in the field of improved hospital records. It is, however, difficult for a national agency of this type to maintain day-by-day supervision over the wide scope of hospital activities. The Hill-Burton Program of the 79th Congress has been another very significant factor in improving hospitals.

Activity of the Division of Hospital Facilities in the field of hospital licensure is reflected, to some extent, by the number of closures of institutions which have been unable to meet the Department's standards. Between 1941 and 1949 there were a total of 30 hospital closures. Since 1950, the number has increased to 51. For the most part, these closures have occurred among small private hospitals which could not acquire sufficient financial resources with which to meet the Department's minimum requirements. A certain number of proprietary hospitals have, however, taken active measures to satisfy the regulations of the Department of Public Health and have remained in operation. It is noteworthy that accreditation by the Joint Commission has been acquired by at least three such hospitals during the past two or three years.

During the past five years, 18 new hospitals have been built in Massachusetts, while 34 additional institutions have had complete renovation of all service departments. Of the former number, 16 were Hill-Burton projects and, of the latter, 24 received Federal aid under this program. Only 19 hospitals have not undergone major physical alteration during this period. It is considered that 17 of this number merit attention along such lines. Encouragement by the Hospital Survey and Construction Program has been of considerable value in such situations and will continue to be for the duration of the program.

In several instances, hospitals, having been unable to comply with Department regulations in the general hospital classification, have elected to eliminate maternity or surgical sections. Hospitals from which maternity and surgical departments have been eliminated may make application for the classification chronic disease hospital. The need for such facilities is very urgent throughout the State. A summary of improvements in 144 hospitals is noted in Table I. It is apparent

that major improvements have taken place in all departments of licensed hospitals. It will be noted, for example, that of 121 hospitals with maternity wards, 65 or 52 per cent have been brought up to standard. Of this number, 53 or 43 per cent received Federal aid under the Hill-Burton Program. In the same manner, in 82 (68 per cent) of 121 hospitals, new additions or major alterations provided newborn nurseries which comply with recognized standards. Of 144 hospitals with operating suites, 89 or 61 per cent are now in accordance with minimum regulations. Improvements for each department are recorded in Table I.

TABLE I — *Improvements in General Hospitals in Massachusetts by Department*

| Departments or Services | Number of Departments or Services Available | Improvements in Services or Departments | | Improvements Aided by Federal Funds | |
|---|---|---|---|---|---|
| | | Number | Per Cent | Number | Per Cent |
| Maternity Bed Areas | 121 | 65 | 52.9 | 53 | 43.9 |
| Delivery Suites | 121 | 76 | 62.8 | 57 | 47.1 |
| Newborn Nurseries | 121 | 84 | 68.3 | 57 | 46.3 |
| Medical and Surgical Wards | 144 | 119 | 82.6 | 54 | 49.3 |
| Operating Suites | 144 | 89 | 61.8 | 59 | 40.9 |
| X-ray Departments | 144 | 95 | 65.9 | 58 | 40.3 |
| Clinical Laboratories | 144 | 89 | 61.8 | 58 | 40.3 |
| OPD including Emergency | 118 | 51 | 43.2 | 40 | 33.9 |
| Kitchen Faciltites | 144 | 79 | 54.9 | 52 | 36.1 |

In 1949, of a total of 17,278 general hospital beds in Massachusetts, 8085 (46 per cent) were nonacceptable, according to standards established by the United States Public Health Service in the regulations set up under the Hill-Burton Program. In 1956, the total number of general hospital beds increased to 19,356 and only 5823 or 30 per cent were nonacceptable.

Apart from physical plant, upgrading has occurred in other areas. Records have been improved, both in hospitals accredited by the Joint Commission as well as in those which have not sought accreditation. Further progress in this area will result from recent legislation empowering the Department to make examination of records, as well as of staff qualifications at the expense of the hospitals. Considerable attention has been paid to medical staffing patterns in hospitals by the Division. In one instance, hospital closure by the Department was averted by a major reorganization of the medical staff by the board of trustees of the hospital.

Improvements in other areas have also occurred. With the cooperation of the Blood Bank Committee of the Massachusetts Medical Society, there has been a complete revision of the Department's regulations for the operation of blood banks. Similarly, emergency medical coverage has been stressed by the inspectional staff. Pharmacies and central supply areas have also been improved. Results in many other areas have been gratifying. The demand for assistance and guidance, available through the staff of the Division of Hospital Facilities, is steadily growing.

Improvement in all phases of nursing and boarding home operation has become apparent during the past five years. This has been most marked in areas where the inspectional staff has been concentrating its activities, namely in housekeeping, nutrition, records and nursing care. It is expected that a recent revision of nursing home regulations will result in additional improvement in nursing homes. Formal revision of boarding home regulations is presently under way.

The Division has been aided in its work by the cooperation of the Massachusetts Federation of Nursing Homes, on the one hand, and the Massachusetts Federation of Rest Homes, on the other. Short courses and seminars have been held jointly with these organizations, the purpose of which has been better care in these institutions.

In 1955, the Department of Public Welfare increased the rate of payment for public assistance cases. This has been of considerable value in bettering conditions in these homes. In the administration of the nursing and boarding home program, considerable credit is due to the cooperative efforts of the Department of Public Safety, and local boards of health and welfare. The assistance of these, and other agencies, has been invaluable.

An intensive effort has been devoted by the staff of the Division to the licensing of city and town infirmaries. Since 1953, 17 infirmaries have been closed by the Department or have closed voluntarily. Improvement in some of these institutions has been slow, but progress has been noted. In a small number of institutions, major problems still exist.

In spite of the many difficulties which have presented themselves in the Department's licensing program and in spite of the small number of workers available to the Department for the administration of the program, achievements have been gratifying in terms of better patient care in the many institutions licensed by the Department. Supervision of medical-care activity is a relatively new responsibility for public health. However, it is apparent that the public, legislators and the profession itself are gradually learning the lesson that better medical care, in the long run, means better public health.

## Hospital Survey and Construction

*Developing the State Plan*

The first State Plan for the administration of Public Law 725 (Hill-Burton Program), which was published in 1947, was subsequently revised to take into account obsolescent and substandard facilities. A certain proportion of the general hospital buildings in the State had been constructed at the turn of the century and were considered obsolescent according to modern standards. Some buildings were of frame construction or substandard in other respects.

Subsequent revisions of the Plan considered not only obsolescence but the adequacy of the major departments in hospitals. Consideration was given to such items as the surgical department, the maternity department, laboratories, x-ray facilities, kitchens, dining rooms, power plants, laundries and patients' service facilities, including elevators, diet kitchens and utility rooms. By this method the hospital's priority in the State Plan not only reflected its bed count, type and age of structure, but also afforded a complete evaluation of its patient and service facilities. This feature was unique in the Massachusetts Plan.

In addition to the priority scheme established for general hospitals, special consideration was given in the Massachusetts Plan to certain other categories. It was found, early in the program, that a large proportion of the federal funds allotted to Massachusetts would be, of necessity, allocated to rural areas or to urban centers removed from Boston, where the teaching hospitals closely allied to the State's three medical schools are located. It was believed that the training program of these teaching hospitals was vital to the proper staffing of the steadily growing hospitals in the more peripheral areas of the State. For this reason teaching hospitals, closely associated with medical schools and providing, in addition, facilities for postgraduate study of interns, residents and graduates, were declared eligible for federal assistance under a separate category designated as "Teaching Hospitals."

Further, it became evident in 1947 that obstetric departments in many general hospitals and some maternity hospitals were inadequate from many points of view. It will be recalled that during 1946 and 1947 extreme overcrowding on maternity wards was associated with extensive outbreaks of diarrhea of the newborn, not only in Massachusetts, but in many other states. The hospital survey revealed, among other things, such inadequacies as non-segregation of delivery suites and maternity wards, lack of sufficient labor rooms and overcrowding in newborn nurseries. Because of these conditions, it was believed that alterations and improvements of such poor facilities should be encouraged with federal assistance. A special priority was therefore established whereby general hospitals, not otherwise holding a high priority and requiring essential improvements in the maternity departments, were declared eligible for participation in the hospital survey and construction program.

The survey of existing facilities revealed yet another problem. In several sections of the State it was found that frame dwellings had been converted into small general hospitals. Some of these buildings were overcrowded and inadequate in patient and medical service facilities and constituted real fire hazards. Fortunately, many of these buildings were located in hospital service areas that were subsequently found to hold high priority for federal assistance.

After a number of conferences with federal officials regarding the significance of several criteria used in the development of the Massachusetts State Plan (i.e., adequacy of hospital departments, obstetrical facilities, etc.), it was suggested that a new basis of determining acceptability of hospital beds be used — one that would be comparable to the standards being applied in other states.

Therefore, in developing the Plan in 1955, the number and acceptability of beds in a given hospital facility was based on two criteria only: (1) To be classified acceptable, a bed should occupy a hospital area of eighty square feet in a (2) building which is considered fireproof, semi-fireproof or of heavy timber construction (Section 301, Classification of Construction, National Fire Protective Association).

*The Construction Program*

Funds have been distributed for hospital and health-center construction since 1948, with a total allocation to Massachusetts of $16,660,000. Except for the fiscal year beginning July 1, 1953, when the annual appropriation was reduced to $65,000,000, at least $75,000,000 had been allocated annually throughout the country. In 1950 the appropriation had been doubled by an amendment to the law to $150,000,000 annually. However, with the advent of war in Korea, the appropriation was again reduced to the original figure of $75,000,000.

These funds have assisted 71 hospital construction projects throughout the State. Table I shows a breakdown of the projects under Public Law 725.

TABLE I — *Distribution of Projects Constructed Under Public Law 725, by Type of Medical Facility*

| Type of Facility | Number of Projects | Number of Beds Added | Number of Bassinets Added | Bed Capacity on Completion | Bassinet Capacity on Completion |
|---|---|---|---|---|---|
| Maternity hospital | 2 | 98 | 104 | 122 | 114 |
| Teaching hospital | 9 | 702 | 87 | 2,940 | 389 |
| Other general hospital | 46 | 3,082 | 437 | 6,171 | 1,264 |
| Totals | 57 | 3,882 | 628 | 9,233 | 1,767 |
| Chronic disease hospital | 9 | 1,002 | – | 1,803 | – |
| Mental hospital | 1 | 32 | – | 32 | – |
| Public health center | 3 | – | – | – | – |
| Laboratory | 1 | – | – | – | – |
| Grand Totals | 71 | 4,916 | 628 | 11,068 | 1,767 |

In July 1955 Massachusetts was allocated $388,790, its first annual grant under the so-called Wolverton Amendment providing funds for the construction of diagnostic and treatment centers, rehabilitation centers, non-profit nursing homes and chronic hospital beds.

The funds were distributed among five construction projects: (1) the Boston Dispensary Rehabilitation Institute; (2) the improvement and expansion of outpatient departments at Beverly and (3) Lawrence General Hospitals; (4) a chronic disease research unit at the Peter Bent Brigham Hospital; (5) a psychiatric research unit for children at the new Judge Baker Guidance Center.

A significant milestone in interstate cooperation was achieved when Maine and Vermont each assigned the Boston Dispensary Project $100,000, their own 1955 allotment for rehabilitation centers.

*General Hospitals*

Fifty-seven general hospital projects received federal assistance. Ten of these were completely new facilities. These were in Needham, Athol, Milton, Clinton, Palmer, Lynn, Groton, Springfield, Webster, Danvers and Nantucket. Athol had not previously had a hospital. Almost all enjoy occupancy rates well over 70 per cent. Of the 57 general hospitals, nine were teaching hospitals and another two were maternity hospitals. Of the latter, one project, the Wesson Maternity Hospital in Springfield, was completely new, making it possible for two general hospitals in Springfield to close their inadequate maternity departments.

Consideration of the regional distribution of projects shows that 58.1 per cent of the money was allocated to the Greater Boston Region; 13.0 per cent to the Springfield; 16.1 per cent to the Worcester; 7.1 per cent to the Beverly-Salem; 4.2 per cent to the Barnstable; and 1.5 per cent to the Pittsfield Region. It is reassuring to note that by and large there is a fair degree of correlation between the percentage distribution of funds and the population density. In this connection, it must be realized that the priority scheme for general hospitals, which is based on existing, suitable beds and other lesser factors as well as population density, might in some instances fail to support the correlation of new hospital construction and population density.

Most of the general hospital beds were added in intermediate urban areas surrounding Boston, Worcester and Springfield. Of the 3882 general hospital beds, 446 (11.4 per cent) were built in rural areas (population less than 25,000).

The re-survey of beds in 1955 revealed that there are 13,467 acceptable general hospital beds, the lowest reported since 1949, despite the fact that about 4000 beds have been built with federal assistance since that time. Table II shows the tabulation of acceptable and nonacceptable general hospital beds during the past seven years.

TABLE II — *Existing Acceptable and Nonacceptable General Hospital Beds by Years*

| | 1949 | 1950 | 1951 | 1952 | 1953 | 1954 | 1955 |
|---|---|---|---|---|---|---|---|
| Acceptable . . . | 13,006 | 13,653 | 15,422 | 15,368 | 15,739 | 16,197 | 13,467 |
| Nonacceptable . . | 4,990 | 4,990 | 4,581 | 5,705 | 4,344 | 3,817 | 5,998 |

Using the federal allowance of 4.5 beds per thousand population, Massachusetts needs 24,078 beds, indicating an acceptable bed deficit of 10,611.

*Chronic Disease Hospitals and Nursing Homes*

Nine projects were approved for chronic disease hospitals. The Municipal Hospital in Springfield is the largest chronic disease hospital to be constructed in Massachusetts with Federal aid. The operation of this 463-bed facility by a community the size of Springfield constitutes a new departure in medical care. The progress of this hospital is being closely watched.

In November 1955 a new chronic disease unit was opened in Holyoke, replacing a typical city infirmary. This institution is providing care not only to welfare recipients, but also to private patients in Holyoke and neighboring communities. Large multiple-bed wards have made it possible to erect a hospital of 120 beds at a cost slightly in excess of $1,000,000.

Other chronic disease projects consisted of additions to five existing general hospitals providing a total of 355 beds for short-term care of patients with chronic disease. These are located at the Children's Medical Center and the New England Deaconess Hospital in Boston; the New England Sanatorium and Hospital in Stoneham; the Malden and Cape Cod Hospitals. Also 34 chronic beds were added to an existing tuberculosis hospital in Barnstable County and 50 beds were added to the Jewish Memorial Hospital, a long-term chronic facility in Boston.

The same standard of acceptability was applied to chronic disease beds as with the general hospital beds in the 1955 survey. This also resulted in a new low count for chronic beds; namely 2628. This compares with an overall need of 9944 chronic beds based on the federal standard of two beds per thousand population, or a deficit of 7316 beds. Notwithstanding this substantial shortage of chronic disease beds, there has not been much interest in the construction of chronic disease facilities.

All project applications in this category have been granted.

It is apparent that the 5332 acceptable and nonacceptable chronic disease beds in the State provide for only a small portion of the patients requiring such care.

Nursing homes in Massachusetts presently make available 14,685 beds for patients requiring long-term care. Only 302 of these beds are acceptable. The

federal standard of providing three nursing home beds per thousand population indicates that the State has a deficit of approximately 14,000 acceptable beds in this category.

*Teaching Hospitals*

Funds were made available to the majority of the teaching-hospital projects primarily for the purchase of equipment. A few were construction projects. At the Massachusetts Eye and Ear Infirmary, operating rooms were constructed and 22 beds were added. Projects at the Peter Bent Brigham Hospital provided 39 additional beds, six beds for intensive chronic disease research, and expanded outpatient department facilities. At the Boston Lying-in Hospital several clinics were added in the outpatient department, and at the New England Center Hospital the construction of a new pathology department was started with federal funds. The Massachusetts General Hospital is constructing a new Medical Science Building with 20 research beds under the program.

*Tuberculosis Hospitals*

There have not been any beds constructed in this program for tuberculosis patients as such.

A survey of tuberculosis beds was not undertaken in 1955, the data being taken from a previous survey in 1953. According to the latter survey, there are 2534 tuberculosis beds in the State. This compares with a computed need of 3282 beds, based on a formula recommended by the Public Health Service which allows 1.5 beds for each of the annual number of new cases for the latest two-year period.

However, no new tuberculosis beds are being programmed in the State in spite of the fact that many of the existing facilities are badly outmoded. Faced with a steadily declining census, most tuberculosis hospitals are inclined to admit other types of patients such as those with chronic disease. What this change in basic policy entails in the way of physical plant remains to be seen.

*Mental Hospitals*

One mental health facility project has been assisted in this program; namely, a four-story, 32-bed psychiatric unit for boys and girls. This is the new Judge Baker Guidance Center being built on property adjacent to the Children's Medical Center.

State institutions for the mentally ill continue to suffer from severe crowding. On the basis of current population estimates, the State should have 24,860 mental hospital beds. Sixty-five per cent of this need has been met. Two of the seven new construction projects undertaken by the State Department of Mental Health have been completed: the project at Grafton with 297 beds and the one in Boston with 300 beds.

It is unlikely that federal construction funds available under this program will be used for State mental hospital facilities for some time. The need for new facilities in this category is so great that the limited funds available in this program would scarcely provide more than token sustenance.

*Public Health Centers*

It will be noted that, in spite of the dearth of public health centers throughout the State, only three were approved, the first in Quincy and the second in Brookline; the third, which is being planned in Amherst, will be under the jurisdiction of the University of Massachusetts. Although such construction holds a high priority in the State program, there has been little interest in this category on the part of city and town officials.

*Diagnostic and Treatment Centers*

Initial studies show that somewhat more than one-fifth of the State's population does not have easy access to outpatient clinics. Does this mean that these people have poorer medical services than those having outpatient clinics? Or are there other compensating factors in these "have-not" communities?

Until these questions can be answered communities which do not have outpatient clinics are being rated as having a greater need for these services than those that do have them. The formula for determining the priority in this category is therefore based on the average usage of existing clinics in the State and is derived from the relative need of all communities for these services obtained by comparing the population density with this average. Also in recognition of the value of the outpatient clinic as a teaching tool, teaching hospitals are given a high priority in this category.

Seventy per cent of the funds allocated to this category are being earmarked for general outpatient clinics or services, while 30 per cent are being set aside for child guidance and mental health clinics. These funds shall be interchangeable should the demand in either category be less than the funds available in a given year.

*Rehabilitation Centers*

A survey of all rehabilitation services available in the State has been made. The facilities include not only medical services for physical restoration, but vocational services such as special schools, sheltered and curative workshops.

Two rehabilitation centers have been programmed to provide for the needs of the eastern part of the State. It is anticipated that each center will be comprehensive in character, providing all facets of rehabilitation. The availability of three medical schools in the Boston area offers assurance that adequate personnel will be available to staff these centers in the several specialties. One of these centers is already under construction. In addition, rehabilitation centers are being programmed in Worcester and Springfield to provide comprehensive services for the western part of the State. It is expected that the availability of several large hospitals in Worcester and Springfield will make adequate staffing of a comprehensive rehabilitation program possible.

Both of these cities have an established agency offering a wide variety of rehabilitation services. In the case of Worcester the agency's major deficiency is the inadequacy of its facility. Springfield has an ideal facility, its deficiencies being related more to organization and administration.

*Massachusetts State Plan*

All expenditures for construction under this program continue to be made on the advice of the agency's 42-member Hospital Advisory Committee subject to final approval by the Public Health Council.

The major planning tool or guide used by the Division of Hospital Facilities for evaluating and approving applications for new hospital facilities is the Massachusetts State Plan. This is a major inventory of all hospital and medical facilities (profit as well as non-profit) in the State. Initially compiled by the Division of Hospital Facilities in 1947, the status of these facilities and the utilization of their services are brought up to date annually by field studies and statistical reports. The State Plan enables the Division's staff to evaluate the relative need of communities in the State for hospital beds and other medical facilities, and (thereby) fulfill its role as one of the Commonwealth's central planning agencies in the field of medical care.

# BUREAU OF TUBERCULOSIS AND INSTITUTIONS

## DIVISION OF SANATORIA AND TUBERCULOSIS

The six years covered by this cumulative report, July 1, 1949 through June 30, 1956, brought into sharp focus trends and developments of tuberculosis control whose origins were in the late 1940's. The anti-tuberculosis drugs were introduced at that time, and since then certain trends have been accelerated. The death rate, 9.4 in 1955 for all forms of tuberculosis, declined 56 per cent since 1950, while the case rate decreased only 23 per cent. The major decline occurred in "other forms" of tuberculosis. Here the death rate dropped 75 per cent. The newer drugs, particularly isonicotinic acid hydrozid (INH), contributed to this accomplishment. Tuberculous meningitis in previous years, once correctly diagnosed, meant death. Now its sequelae persist to plague the ingenuity of the medical profession.

These six years have been exciting and challenging. Problems associated with tuberculosis in its treatment, public health practice, rehabilitation, hospital administration, and financing created a period in which constant evaluation of past practices was necessary. Two of the anti-tuberculosis drugs, which may be given in pill form, placed treatment in the home. The private physician was being forced into a field previously dominated by a small group of specialists. Newer and more effective methods of educating the lay person and the professional in tuberculosis control and rehabilitation were made necessary.

Standard methods of treatment such as pneumothorax, effective in the past, were discarded. Prolonged periods of bed rest and hospitalization were no longer necessary. The anti-tuberculosis drugs were given over longer periods of time, one and a half to two years and longer. Surgical resection, i.e., a removal of a small portion of the lung, developed as the preferred procedure in conjunction with rest and the drugs.

More patients being treated for shorter periods in sanatoria, combined with a sky-rocketing cost of hospitalization, plagued the hospital administrator and those engaged in financing these institutions. How should the vacant beds, at times as high as 50 per cent of capacity, be used to best advantage? Legislation was enacted to permit the signing of appropriate contracts between various agencies. In this way, Burbank Hospital in Fitchburg, Belmont Hospital in Worcester, the Springfield Health Department Tuberculosis Hospital and Brookline Tuberculosis Hospital were closed and the tuberculous treated elsewhere.

Associated with the decline in the number of deaths was a slower decline in new cases reported annually. Actually there was an increased prevalence of tuberculosis in the older age groups. The tuberculin test proved that there was less infection in school children as compared to thirty years ago. A tuberculin testing program done in the school population of Lowell and elsewhere indicated a marked decline in the percentage of positive reactors from 30 per cent to 2-plus per cent.

During this period it became apparent that tuberculosis was being found more frequently in special groups — the lower socioeconomic groups, particularly males over 40; certain racial groups, and large urban populations as compared to rural.

Large population groups are reaching adult life without being exposed to tuberculosis. For this reason a significant change was necessary in tuberculosis case finding methods. Greater attention was required in selecting groups with a higher prevalence of unrecognized tuberculosis. Efforts were concentrated in certain areas of the larger cities, in nursing homes, jails, hospitals, "flop houses" and in certain racial groups.

A bill sponsored by this Division was enacted in 1951 but repealed before becoming effective. It established the State as the principal agency responsible for tuberculosis control on a State-wide basis.

Federal grants, markedly cut during this period, still remain a vital prop in Massachusetts tuberculosis control. Through the use of these funds tuberculosis case registers have been established in many new communities, and there has been a sweeping reorganization of the tuberculosis case reporting system.

The schools for the training of licensed practical nurses, the educational programs for affiliate nurses, in-service training and other similar programs were emphasized, enlarged and improved. Had it not been for these programs and the subsequent recruitment of nurses, the Departmental hospitals would have found survival difficult indeed.

School personnel were required every three years to be certified free of tuberculosis in a communicable form under Chapter 732 of the Acts of 1950.

Dr. Alton S. Pope, Director of the Division of Tuberculosis and Sanatoria and Deputy Commissioner of the Department of Public Health, retired July 31, 1954, after thirty years of dedicated service to the community. Such men as he are irreplaceable.

The poliomyelitis epidemic in 1955, which required the mobilization of all resources throughout the State, produced a lasting example of community responsibility and consciousness in admirably meeting a prolonged and difficult crisis. Lakeville State Sanatorium, Lemuel Shattuck Hospital, and Massachusetts Hospital School contributed greatly to this general effort.

## Departmental Institutions

*Lakeville State Sanatorium*

With the decline in the number of cases with orthopedic tuberculosis it was possible to admit more patients with other crippling conditions. The needs of the community were acknowledged when enabling legislation permitted the admission of patients with arthritis, neuromuscular disorders, aging persons and those with other conditions requiring physiotherapy and long-term care.

Treatment plans for the arthritics were developed in close cooperation with the Massachusetts General Hospital. This service has proved of great value and is steadily expanding. A limited number of patients with multiple sclerosis are treated.

A special unit for children with cerebral palsy and an I.Q. of between 50 and 80 has been established. A service for the correction of orthopedic defects in children confined to mental institutions has been created.

Rehabilitation has been increasingly stressed through surgery, orthopedic appliances and physiotherapy. The rising trend in the average daily census of patients at the sanatorium gives evidence of the increased demand for these services.

The appended tables (I through IV) show a 50 per cent drop in the tuberculosis patient census, particularly in children, during this period. The remaining tables demonstrate fluctuations in admission of other conditions with the daily patient census increased to meet increased community needs.

*Lemuel Shattuck Hospital*

The Lemuel Shattuck Hospital opened for patients on October 4, 1954. The hospital population expanded steadily until 253 beds were in operation. Further expansion has been prevented by the lack of registered nurses.

On August 17, 1955 a temporary polio respirator unit was established, and on November 6, 1956 this was moved to permanent quarters on the seventh floor of the hospital.

In addition to the care of patients, special laboratories for the study of chronic pulmonary disease, hypertension, radioisotopes, and biochemistry are in operation. Eight research projects are now under way. Teaching and training have progressed steadily.

The hospital was accredited by the Joint Board on November 18, 1955 and approved for residency training in internal medicine and pathology in 1956. Residency affiliation with the Beth Israel, Boston Veterans Administration, Mount Auburn, Massachusetts General and New England Medical Center hospitals is now in operation. Students from Harvard, Tufts and Boston University Medical Schools and the Harvard School of Public Health come to the hospital regularly.

The School of Licensed Practical Nurses began operation in September 1956 and will graduate its first class early in 1958.

*Massachusetts Hospital School*

In 1954 the Legislature transferred this excellent institution to the Department of Public Health. A Resident School, in which is integrated a small hospital, admits physically handicapped children who are unable to attend public school, whose medical treatment would interfere with continued schooling, or whose medical care warrants long-term hospital treatment. Admission policies of this school and of Lakeville have been integrated so that no duplication of objectives exists. Children from the age of three to twenty-one are treated, and remain as patients as long as continued improvement is observed. Although improvement in the physical plant has taken place, further expansion is necessary if the needs of the community are to be met.

*North Reading State Sanatorium*

The 26-bed unit for children with rheumatic heart disease which was opened at North Reading in April of 1949 was closed May 8, 1951. During the following fiscal year 1951–1952 a considerable backlog of tuberculosis patients were admitted. The daily average of patients for the period 1949 through June 30, 1956 ranged from 149 to 140.

The age-adjusted admission rates per 100,000 are shown below.

| Age Group | 1936 | 1946 | 1956 |
|---|---|---|---|
| 0–5 | 7.6 | 6.5 | 8.6 |
| 5–9 | 14.1 | 8.4 | 5.8 |
| 10–14 | 19.4 | 3.9 | 4.2 |
| 15– | 10.5 | 2.4 | 3.4 |

It will be noted that the admission rate for children 0–5 years of age has been maintained. The rates for older children fell sharply between 1936 and 1946 and then remained fairly constant. The reasons for this are not clearly understood. One fact should be stressed. Adults with a greater incidence of tuberculosis are responsible in large measure for transmitting the disease to the younger children who are of necessity in close contact with them.

Tables I, II, III and IV show there has been no appreciable change in the number of admissions during this period. There has been a noticeable increase in the ratio of younger children; fifty per cent were under five years of age.

*Pondville Hospital*

During the years between 1949 and 1956 over two million dollars have been spent for the renovation of old buildings and new construction to provide adequate facilities for the expansion of the cancer control program at the Pondville Hospital. Thanks to the local Cancer Society, $10,000 established a research facility which was later dedicated as the Ira T. Nathanson Research Laboratory.

A Practical Nurses' Training School was created, and during this period ten classes were graduated, thus permitting us to increase our active bed capacity to one hundred patients. Our outpatient activity has continued to increase so greatly that a new general clinic was added weekly.

The Volunteer Social Service Committee established and equipped a chapel which is used for all denominations.

Numerous groups of students from the medical schools in Boston have attended our clinics for teaching purposes, and physicians, nurses and public health workers visited the hospital from 26 different states and 40 foreign countries.

The twenty-fifth anniversary of the opening of Pondville Hospital was celebrated on June 25, 1952.

In honor of our Chief of Staff, Dr. Ernest M. Daland, the Alumni Society was formed, consisting of all former resident doctors who trained at Pondville.

Following are a few statistics for the period:

| | 1950 | 1951 | 1952 | 1953 | 1954 | 1955 |
|---|---|---|---|---|---|---|
| Admissions | 982 | 1,122 | 1,334 | 1,261 | 1,391 | 1,567 |
| Clinic visits — new | 1,444 | 1,386 | 1,379 | 1,578 | 1,604 | 1,555 |
| Clinic visits — return | 8,608 | 8,814 | 10,411 | 11,444 | 11,937 | 12,675 |
| Average period of hospitalization | 22.5 | 20.5 | 17.8 | 21.4 | 24.1 | 22.1 |
| Average number of patients | 57.5 | 57.9 | 62.8 | 71.6 | 89.3 | 91.6 |
| X-ray treatments | 6,908 | 6,398 | 7,242 | 7,442 | 5,261 | 6,007 |
| Operations | 1,113 | 1,445 | 1,574 | 1,404 | 1,579 | 1,579 |
| Laboratory tests | 22,446 | 27,901 | 26,952 | 30,195 | 30,401 | 34,104 |

*Rutland State Sanatorium*

By 1949 we were able to evaluate some of the results of streptomycin therapy. Two hundred and thirty patients had already been treated with this antibiotic and the effects were remarkable. From that time on there was a sharp decline in pneumothorax therapy. Pneumoperitoneums, however, were continued for a few years. There are very few at present. Pulmonary function tests began in 1950 and have continued to date on an increasing number of patients.

Isonicotinic acid hydrazide came during 1952 and proved immediately to be as effective as streptomycin. As the years went by, drug therapy was extended to every patient and the time of administration was prolonged to a year, and then to two years.

Thoracoplasty as a collapse measure was abandoned during the years 1950–1953.

Our Rehabilitation Service has been kept with the help of a rehabilitation director, a librarian, a teacher and an occupational therapist. Our Social Service Department has also been functioning most of the time.

An intensive repair program has been carried out during the past eight years in an effort to bring the institution to modern physical standards.

Tables I and II show a marked increase in the male as compared to female admissions, as well as an increase in the average age of males. Most of the admissions were referred from general hospitals and the great majority of cases were far advanced.

*Westfield State Sanatorium*

The Westfield State Sanatorium has noted during this period the following changes: In the physical plant, since farm operations contribute nothing to patient rehabilitation, the unprofitable farm was closed on April 19, 1951. As of November 17, 1955, the electrical generators were changed to alternating current and linked with a public utility supply.

In professional training, on January 4, 1950 the School for Practical Nurses opened. Its students and graduates have helped to keep all 191 hospital beds open during nursing shortages. On July 1, 1953 the dental service was reorganized around a one-year internship. Slow progress is being made toward approval through affiliation for the residency in pathology. Approval of the three residencies in pulmonary diseases continues. Continued approval of the three residencies in cancer surgery hinges on making each the third-year affiliation in an approved four-year program.

In clinical services, on November 30, 1949 the hospital added radioactive cobalt to its cancer armamentarium. Full accreditation of the hospital was reaffirmed on September 12, 1955.

The Tuberculosis Section showed the same general trends as Rutland, whereas the Cancer Section showed a gradual increase in admissions, with females predominating.

# LAKEVILLE STATE SANATORIUM

## TABLE I — *Patient Census, December 31: Tuberculosis*

| | | 1950 | 1951 | 1952 | 1953 | 1954 | 1955 |
|---|---|---|---|---|---|---|---|
| Patient Census Dec. 31 | Children: Male | 17 | 15 | 14 | 12 | 5 | 6 |
| | Female | 14 | 9 | 14 | 13 | 6 | 6 |
| | Adults | 78 | 72 | 59 | 39 | 45 | 33 |
| | Total | 109 | 96 | 87 | 64 | 56 | 45 |

## TABLE II — *Daily Average Number of Patients: Tuberculosis*

| | 1950 | 1951 | 1952 | 1953 | 1954 | 1955 |
|---|---|---|---|---|---|---|
| Number | 114.7 | 110.9 | 105.6 | 86.6 | 61.4 | 55.5 |

## TABLE III — *Number of Patients Admitted and Discharged: Tuberculosis*

| | 1950 | 1951 | 1952 | 1953 | 1954 | 1955 |
|---|---|---|---|---|---|---|
| Admissions | 142 | 144 | 153 | 98 | 88 | 82 |
| Discharges | 132 | 157 | 162 | 120 | 95 | 93 |

## TABLE IV — *Diagnosis on Admission: Bone and Joint Tuberculosis*

| | Adults | | Children | | Total | Percent of All Admitted for Tuberculosis |
|---|---|---|---|---|---|---|
| | Male | Female | Male | Female | | |
| 1950* | 18 | 6 | 3 | 5 | 32 | 22.5 |
| 1951* | 11 | 11 | 6 | 4 | 32 | 22.5 |
| 1952* | 16 | 9 | 3 | 5 | 33 | 21.6 |
| 1953 | 15 | 11 | 7 | 8 | 41 | 41.8 |
| 1954 | 10 | 13 | 5 | 2 | 30 | 34.1 |
| 1955 | 13 | 11 | 3 | 3 | 30 | 36.6 |

## TABLE V — *Daily Average Number of Patients: Poliomyelitis*

| | Adults | | Children | | |
|---|---|---|---|---|---|
| | Male | Female | Male | Female | Total |
| 1950 | 3.7 | 7.2 | 11.8 | 5.4 | 28.1 |
| 1951 | 1.6 | 6.9 | 6.2 | 6.4 | 21.1 |
| 1952 | 1.3 | 5.3 | 3.5 | 3.3 | 13.4 |
| 1953 | 2.8 | 6.2 | 5.4 | 2.7 | 17.1 |
| 1954 | 1.4 | 4.1 | 9.6 | 6.6 | 21.7 |
| 1955 | 3.4 | 8.2 | 16.5 | 13.0 | 41.0 |

## TABLE VI — *Female per Male Ratio: Adults, Poliomyelitis*

| | 1950 | 1951 | 1952 | 1953 | 1954 | 1955 |
|---|---|---|---|---|---|---|
| Females per male | 1.9 | 4.3 | 4.1 | 2.2 | 2.9 | 2.4 |

## TABLE VII — *Stage of Disease: Poliomyelitis*

| Stage | 1950 | 1951 | 1952 | 1953 | 1954 | 1955 |
|---|---|---|---|---|---|---|
| II | 0 | 0 | 0 | 0 | 0 | 90 |
| III | 32 | 15 | 9 | 22 | 30 | 7 |
| IV | 7 | 9 | 12 | 9 | 4 | 6 |

*Vertebral column excepted.

TABLE VIII — *Admissions 30 Years of Age and Over: Poliomyelitis*

| | 30 and over | Total All Ages | Percent 30 and over |
|---|---|---|---|
| 1950 | 4 | 41 | 29.8 |
| 1951 | 6 | 34 | 17.6 |
| 1952 | 5 | 21 | 23.8 |
| 1953 | 2 | 31 | 6.4 |
| 1954 | 3 | 34 | 8.8 |
| 1955 | 20 | 103 | 19.4 |
| Total | 40 | 264 | 15.2 |

TABLE IX — *Condition on Discharge: Poliomyelitis*

| | Improved | | | | | |
|---|---|---|---|---|---|---|
| | Number | Percent | Unchanged | Dead | Non-Polio | Total |
| 1950 | 48 | 98.0 | 1 | 0 | 0 | 49 |
| 1951 | 35 | 89.7 | 3 | 1 | 0 | 39 |
| 1952 | 12 | 70.6 | 5 | 0 | 0 | 17 |
| 1953 | 23 | 95.8 | 1 | 0 | 0 | 24 |
| 1954 | 27 | 93.1 | 0 | 2 | 0 | 29 |
| 1955 | 62 | 96.9 | 1 | 1 | 0 | 64 |
| Total | 207 | 93.2 | 11 | 4 | 0 | 222 |

TABLE X — *Daily Average Number of Patients, Crippled Children* (1950–1952) *Crippling Conditions* (*1953–1955*)

| | Children | | | Adults | | | |
|---|---|---|---|---|---|---|---|
| | Male | Female | Total | Male | Female | Total | Total |
| 1950 | 20.3 | 16.4 | 36.7 | – | – | – | 36.7 |
| 1951 | 25.9 | 18.0 | 43.9 | – | – | – | 43.9 |
| 1952 | 32.3 | 22.3 | 54.6 | – | – | – | 54.6 |
| 1953 | 25.9 | 27.2 | 53.1 | 1.5 | 8.2 | 9.7 | 62.8 |
| 1954 | 31.8 | 29.3 | 61.1 | 5.9 | 14.8 | 20.7 | 81.8 |
| 1955 | 29.8 | 31.3 | 61.1 | 7.9 | 21.5 | 29.4 | 90.5 |

TABLE XI — *Diagnosis on Admission, Crippled Children* (1950–1952) *Crippling Conditions* (1953–1955)

| | Cerebrospastic Palsy | | Congenital Dislocation and Deformities | | Arthritis | | All Other Crippling Conditions | | Total |
|---|---|---|---|---|---|---|---|---|---|
| | No. | % | No. | % | No. | % | No. | % | |
| 1950 | 42 | 62.7 | 13 | 19.4 | – | – | 12 | 17.9 | 67 |
| 1951 | 26 | 44.1 | 9 | 15.2 | – | – | 24 | 40.7 | 59 |
| 1952 | 31 | 47.0 | 8 | 12.1 | – | – | 27 | 40.9 | 66 |
| 1953 | 24 | 23.1 | 23 | 22.1 | 34 | 32.7 | 23 | 22.1 | 104 |
| 1954 | 19 | 15.8 | 17 | 14.2 | 44 | 36.7 | 40 | 33.3 | 120 |
| 1955 | 21 | 18.8 | 17 | 15.2 | 39 | 34.8 | 35 | 31.2 | 112 |
| Total 1950–1955 | 163 | 30.9 | 87 | 16.5 | 117 | 22.2 | 161 | 30.5 | 528 |
| Total 1953–1955 | 64 | 19.0 | 57 | 17.0 | 117 | 31.8 | 98 | 29.2 | 336 |

TABLE XII — *Daily Average Number of Patients: Tuberculosis, Poliomyelitis, Crippled Children and Crippling Conditions*

| | Tuberculosis | | Poliomyelitis | | Crippled Children | | Total |
|---|---|---|---|---|---|---|---|
| | No. | % | No. | % | No. | % | |
| 1950 | 114.7 | 63.9 | 28.1 | 15.6 | 36.7 | 20.4 | 179.5 |
| 1951 | 110.9 | 63.0 | 21.1 | 12.0 | 43.9 | 25.0 | 175.9 |
| 1952 | 105.6 | 60.8 | 13.4 | 7.7 | 54.6 | 31.4 | 173.6 |
| | | | | | Crippled Conditions | | |
| 1953 | 86.6 | 52.0 | 17.1 | 10.3 | 62.8 | 37.7 | 166.5 |
| 1954 | 61.4 | 37.2 | 21.7 | 13.2 | 81.8 | 49.6 | 164.9 |
| 1955 | 55.5 | 29.7 | 41.1 | 22.0 | 90.5 | 48.4 | 187.1 |
| Average | 89.1 | 51.0 | 23.8 | 13.6 | 61.7 | 35.3 | 174.6 |

# NORTH READING STATE SANATORIUM

## TABLE I — *Admissions and Discharges: Tuberculosis*

| | Admitted | Discharged | Deaths* |
|---|---|---|---|
| 1950 | 77 | 85 | 4 |
| 1951 | 99 | 85 | 1 |
| 1952 | 104 | 93 | 2 |
| 1953 | 95 | 103 | 2 |
| 1954 | 98 | 109 | 1 |
| 1955 | 105 | 101 | 1 |
| Total | 578 | 576 | 11 |

## TABLE II — *Daily Average Number of Patients: Tuberculosis*

| | Male | Female | Total |
|---|---|---|---|
| 1950 | 65.60 | 64.06 | 129.66 |
| 1951 | 64.66 | 61.94 | 134.91 |
| 1952 | 73.05 | 81.60 | 154.64 |
| 1953 | 68.82 | 77.16 | 145.98 |
| 1954 | 78.79 | 65.84 | 144.63 |
| 1955 | 72.53 | 66.73 | 139.35 |
| Average | 70.58 | 69.55 | 141.53 |

## TABLE III — *Patients Admitted 0–4 Years of Age: Tuberculosis*

| | Male | Female | Total | % |
|---|---|---|---|---|
| 1950 | 20 | 14 | 34 | 44 |
| 1951 | 24 | 26 | 50 | 50 |
| 1952 | 25 | 27 | 52 | 50 |
| 1953 | 26 | 18 | 44 | 46 |
| 1954 | 34 | 22 | 56 | 57 |
| 1955 | 30 | 39 | 59 | 51 |

## TABLE IV — *Source of Referral: Tuberculosis*

| | Referred by General Hospitals | | Total Referred |
|---|---|---|---|
| | No. | % of Total | |
| 1950 | 30 | 39.0 | 77 |
| 1951 | 37 | 37.4 | 99 |
| 1952 | 30 | 28.8 | 104 |
| 1953 | 34 | 35.8 | 95 |
| 1954 | 42 | 42.8 | 98 |
| 1955 | 36 | 34.3 | 105 |
| Total | 209 | 36.2 | 578 |

## TABLE V — *Reason for Initial Examination of Tuberculosis Patients Admitted*

| | X-Ray Survey or Other Case-finding Activity | | Contact of a Known Case | | Suspicious Signs or Symptoms | | Routine Physical Examination | | Total |
|---|---|---|---|---|---|---|---|---|---|
| | No. | % | No. | % | No. | % | No. | % | No. |
| 1950 | 0 | 0.0 | 50 | 64.9 | 26 | 33.8 | 1 | 1.3 | 77 |
| 1951 | 0 | 0.0 | 74 | 74.7 | 23 | 23.2 | 2 | 2.0 | 99 |
| 1952 | 0 | 0.0 | 72 | 69.2 | 32 | 30.8 | 0 | 0.0 | 104 |
| 1953 | 0 | 0.0 | 67 | 70.5 | 28 | 29.5 | 0 | 0.0 | 95 |
| 1954 | 0 | 0.0 | 59 | 60.2 | 39 | 39.8 | 0 | 0.0 | 98 |
| 1955 | 1 | 1.0 | 83 | 79.0 | 21 | 20.0 | 0 | 0.0 | 105 |
| Total | 1 | 0.0 | 405 | 70.1 | 169 | 29.2 | 3 | 0.5 | 578 |

*Included in number discharged.

# RUTLAND STATE SANATORIUM

## TABLE I — *Daily Average Number of Patients*

| | Male | | Female | | |
|---|---|---|---|---|---|
| | No. | % | No. | % | Total |
| 1950 | 142.61 | 56.9 | 108.17 | 43.1 | 250.78 |
| 1951 | 140.17 | 64.7 | 76.55 | 35.3 | 216.72 |
| 1952 | 135.60 | 62.7 | 80.70 | 37.3 | 216.30 |
| 1953 | 148.79 | 70.7 | 61.57 | 29.3 | 210.36 |
| 1954 | 163.77 | 77.1 | 48.52 | 22.8 | 212.29 |
| 1955 | 165.94 | 77.2 | 49.10 | 22.8 | 215.04 |
| Total | 896.88 | – | 424.61 | – | 1321.49 |
| Average | 149.48 | 67.9 | 70.77 | 32.1 | 220.25 |

## TABLE II — *Median Age of Patients Admitted*

| | Male | Female | Total |
|---|---|---|---|
| 1950 | 40–49 | 20–29 | 30–39 |
| 1951 | 40–49 | 30–39 | 40–49 |
| 1952 | 40–49 | 20–29 | 40–49 |
| 1953 | 40–49 | 30–39 | 40–49 |
| 1954 | 50–59 | 30–39 | 40–49 |
| 1955 | 50–54 | 45–49 | 45–49 |

## Table III — *Extent of Disease on Admission of Patients*

| | Minimal | | | | | | Moderately Advanced | | | | | | Far Advanced | | | | | | Total Pulmonary | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Male | | Female | | Total | | Male | | Female | | Total | | Male | | Female | | Total | | Male | | Female | | Total |
| | No. | % of Total Male | No. | % of Total Female | No. | % of Total Adm. | No. | % of Total Male | No. | % of Total Female | No. | % of Total Adm. | No. | % of Total Male | No. | % of Total Female | No. | % of Total Adm. | No. | % of Total Adm. | No. | % of Total Adm. | |
| 1950 | 18 | 14.4 | 10 | 10.3 | 28 | 12.6 | 30 | 24.0 | 34 | 35.0 | 64 | 28.8 | 77 | 61.6 | 53 | 54.6 | 130 | 58.6 | 125 | 56.3 | 97 | 43.7 | 222 |
| 1951 | 3 | 2.4 | 7 | 12.5 | 10 | 5.5 | 33 | 26.2 | 21 | 37.5 | 54 | 29.7 | 90 | 71.4 | 28 | 50.0 | 118 | 64.8 | 126 | 69.2 | 56 | 30.8 | 182 |
| 1952 | 2 | 2.4 | 6 | 12.5 | 8 | 6.0 | 26 | 30.6 | 19 | 39.6 | 45 | 33.8 | 57 | 67.0 | 23 | 47.9 | 80 | 60.2 | 85 | 63.9 | 48 | 36.1 | 133 |
| 1953 | 18 | 10.3 | 14 | 23.3 | 32 | 13.7 | 45 | 25.9 | 20 | 33.3 | 65 | 27.8 | 111 | 63.8 | 26 | 43.3 | 137 | 58.5 | 174 | 74.4 | 60 | 25.6 | 234 |
| 1954 | 8 | 5.4 | 5 | 12.5 | 13 | 6.9 | 46 | 31.1 | 13 | 32.5 | 59 | 31.4 | 94 | 63.5 | 22 | 55.0 | 116 | 61.7 | 148 | 78.7 | 40 | 21.3 | 188 |
| 1955 | 16 | 8.4 | 9 | 16.7 | 25 | 10.2 | 53 | 27.7 | 20 | 37.0 | 73 | 29.8 | 122 | 63.9 | 25 | 46.3 | 147 | 60.0 | 191 | 78.0 | 54 | 22.0 | 245 |
| Total | 65 | 7.6 | 51 | 14.4 | 116 | 9.6 | 233 | 27.4 | 127 | 35.8 | 360 | 29.9 | 551 | 64.9 | 177 | 49.8 | 728 | 60.5 | 849 | 70.5 | 355 | 29.5 | 1204 |

## Table IV — *Reason for Initial Examination of Patients Admitted*

| | Contact with a Known Case | | | | | | Suspicious Signs or Symptoms | | | | | | X-ray Survey, Other Case Finding Activity or Routine Physical Examination | | | | | | Total | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Male | | Female | | Total | | Male | | Female | | Total | | Male | | Female | | Total | | Male | | Female | | Total |
| | No. | % of Male | No. | % of Female | No. | % of Total | No. | % of Male | No. | % of Female | No. | % of Total | No. | % of Male | No. | % of Female | No. | % of Total | No. | % of Male | No. | % of Female | |
| 1950 | 5 | 3.5 | 7 | 6.3 | 12 | 4.8 | 115 | 81.6 | 78 | 70.3 | 193 | 76.6 | 21 | 14.9 | 26 | 23.4 | 47 | 18.6 | 141 | 56.0 | 111 | 44.0 | 252 |
| 1951 | 3 | 2.2 | 10 | 14.3 | 13 | 6.4 | 119 | 89.5 | 52 | 74.3 | 171 | 84.2 | 11 | 8.3 | 8 | 11.4 | 19 | 9.4 | 133 | 65.6 | 70 | 34.5 | 203 |
| 1952 | 7 | 4.3 | 8 | 9.8 | 15 | 6.2 | 125 | 77.6 | 65 | 79.3 | 190 | 78.2 | 29 | 18.0 | 9 | 11.0 | 38 | 15.6 | 161 | 66.2 | 82 | 33.7 | 243 |
| 1953 | 3 | 1.6 | 1 | 1.5 | 4 | 1.6 | 171 | 91.9 | 53 | 84.1 | 224 | 90.0 | 12 | 6.4 | 9 | 14.3 | 21 | 8.4 | 186 | 74.7 | 63 | 25.3 | 249 |
| 1954 | 2 | 1.2 | 5 | 9.6 | 7 | 3.1 | 156 | 90.7 | 39 | 75.0 | 195 | 87.0 | 14 | 8.1 | 8 | 15.4 | 22 | 9.8 | 172 | 76.8 | 52 | 23.2 | 224 |
| 1955 | 7 | 3.5 | 8 | 13.8 | 15 | 5.8 | 156 | 78.4 | 41 | 70.7 | 197 | 76.6 | 36 | 18.1 | 9 | 15.5 | 45 | 17.5 | 199 | 77.4 | 58 | 22.6 | 257 |
| Total | 27 | 2.7 | 39 | 8.9 | 66 | 4.6 | 842 | 84.9 | 328 | 75.2 | 1170 | 81.9 | 123 | 12.4 | 69 | 15.8 | 192 | 13.4 | 992 | 69.5 | 436 | 30.5 | 1428 |

TABLE V — *Source of Referral of Patients Admitted*

| | Private M.D. No. | % | San. Con. Clinic or O.P. Dept. No. | % | General Hospitals and Their O.P. Depts. No. | % | T.B. Sanatoriums by Transfer No. | % | Other Sources No. | % | Total No. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **MALE** | | | | | | | | | | | |
| 1950 | 40 | 28.4 | 16 | 11.3 | 36 | 25.5 | 13 | 9.2 | 36 | 25.5 | 141 |
| 1951 | 25 | 18.8 | 6 | 4.5 | 69 | 51.9 | 5 | 3.8 | 28 | 21.0 | 133 |
| 1952 | 34 | 21.1 | 13 | 8.1 | 61 | 37.9 | 31 | 19.2 | 22 | 13.7 | 161 |
| 1953 | 50 | 26.9 | 6 | 3.2 | 90 | 48.4 | 22 | 11.8 | 18 | 9.7 | 186 |
| 1954 | 25 | 14.5 | 6 | 3.5 | 71 | 41.3 | 53 | 30.8 | 17 | 9.9 | 172 |
| 1955 | 39 | 19.6 | 1 | 0.5 | 111 | 55.8 | 27 | 13.6 | 21 | 10.6 | 199 |
| Total | 213 | 21.5 | 48 | 4.8 | 438 | 44.2 | 151 | 15.2 | 142 | 14.3 | 992 |
| **FEMALE** | | | | | | | | | | | |
| 1950 | 43 | 38.7 | 13 | 11.7 | 29 | 26.1 | 1 | 0.9 | 25 | 22.5 | 111 |
| 1951 | 25 | 35.7 | 6 | 8.6 | 21 | 30.0 | 2 | 2.8 | 16 | 22.8 | 70 |
| 1952 | 23 | 28.0 | 9 | 11.0 | 30 | 36.6 | 3 | 3.6 | 17 | 20.7 | 82 |
| 1953 | 18 | 28.6 | 3 | 4.8 | 29 | 46.0 | 5 | 7.9 | 8 | 12.7 | 63 |
| 1954 | 16 | 30.8 | 3 | 5.8 | 26 | 50.0 | 2 | 3.8 | 5 | 9.6 | 52 |
| 1955 | 13 | 22.4 | 2 | 3.4 | 28 | 48.3 | 7 | 12.1 | 8 | 13.8 | 58 |
| Total | 138 | 31.6 | 36 | 8.2 | 163 | 37.4 | 20 | 4.6 | 79 | 18.1 | 436 |
| **BOTH SEXES** | | | | | | | | | | | |
| 1950 | 83 | 32.9 | 29 | 11.5 | 65 | 25.8 | 14 | 5.6 | 61 | 24.2 | 252 |
| 1951 | 50 | 24.6 | 12 | 5.9 | 90 | 44.3 | 7 | 3.4 | 44 | 21.7 | 203 |
| 1952 | 57 | 23.4 | 22 | 9.0 | 91 | 37.4 | 34 | 14.0 | 39 | 16.0 | 243 |
| 1953 | 68 | 27.3 | 9 | 3.6 | 119 | 47.8 | 27 | 10.8 | 26 | 10.4 | 249 |
| 1954 | 41 | 18.3 | 9 | 4.0 | 97 | 43.3 | 55 | 24.6 | 22 | 9.8 | 224 |
| 1955 | 52 | 20.2 | 3 | 1.2 | 139 | 54.1 | 34 | 13.2 | 29 | 11.3 | 257 |
| Total | 351 | 24.6 | 84 | 5.9 | 601 | 42.1 | 171 | 12.0 | 221 | 15.5 | 1428 |

## WESTFIELD STATE SANATORIUM

TABLE I — *Daily Average Number of Patients: Tuberculosis*

| | Male No. | % | Female No. | % | Total |
|---|---|---|---|---|---|
| 1950 | 64 | 48.5 | 68 | 51.5 | 132 |
| 1951 | 63 | 46.0 | 74 | 54.0 | 137 |
| 1952 | 63 | 48.5 | 67 | 51.5 | 130 |
| 1953 | 72 | 55.4 | 58 | 44.6 | 130 |
| 1954 | 76 | 62.3 | 46 | 37.7 | 122 |
| 1955 | 69 | 69.0 | 31 | 31.0 | 100 |
| Total | 407 | – | 344 | – | 751 |
| Average | 67.8 | 54.2 | 57.3 | 45.8 | 125.2 |

TABLE II — *Source of Referral of Patients Admitted: Tuberculosis*

| | Private Doctor No. | % | San. Cons. Clinic or O.P. Dept. No. | % | General Hospitals and Their O.P. Depts. No. | % | Other Sanatoriums by Transfer No. | % | Other Sources No. | % | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1950 | 22 | 16.8 | 56 | 42.7 | 33 | 25.2 | 19 | 14.5 | 1 | 0.8 | 131 |
| 1951 | 22 | 20.0 | 60 | 54.5 | 17 | 15.4 | 10 | 9.1 | 1 | 0.9 | 110 |
| 1952 | 32 | 25.2 | 57 | 44.9 | 14 | 11.0 | 24 | 18.9 | 0 | 0.0 | 127 |
| 1953 | 27 | 20.1 | 54 | 40.3 | 26 | 19.4 | 27 | 20.1 | 0 | 0.0 | 134 |
| 1954 | 23 | 19.2 | 40 | 33.3 | 21 | 17.5 | 32 | 26.7 | 4 | 3.3 | 120 |
| 1955 | 45 | 38.5 | 16 | 13.7 | 27 | 23.1 | 12 | 10.2 | 17 | 14.5 | 117 |
| Total | 171 | 23.1 | 283 | 38.3 | 138 | 18.7 | 124 | 16.8 | 23 | 3.1 | 739 |

TABLE III — *Reason for Initial Examination of Patients Admitted: Tuberculosis*

| | Contact with Known Case No. | % | Suspicious Signs or Symptoms No. | % | X-Ray Survey, Other Case-Finding Activity or Routine Physical Examination No. | % | Total |
|---|---|---|---|---|---|---|---|
| 1950 | 2 | 1.5 | 96 | 73.3 | 33 | 25.2 | 131 |
| 1951 | 1 | 0.9 | 87 | 76.3 | 26 | 22.8 | 114 |
| 1952 | 1 | 0.8 | 27 | 21.2 | 99 | 78.0 | 127 |
| 1953 | 5 | 3.7 | 89 | 66.4 | 40 | 29.8 | 134 |
| 1954 | 2 | 1.7 | 94 | 78.3 | 24 | 20.0 | 120 |
| 1955 | 17 | 14.5 | 80 | 68.4 | 20 | 17.1 | 117 |
| Total | 28 | 3.8 | 473 | 63.7 | 242 | 32.6 | 743 |

TABLE IV — *Median Age of Patients Admitted: Tuberculosis*

| | Male | Female | Total |
|---|---|---|---|
| 1950 | 40–49 | 20–29 | 30–39 |
| 1951 | 50–59 | 30–39 | 40–49 |
| 1952 | 40–49 | 30–39 | 30–39 |
| 1953 | 40–49 | 30–39 | 40–49 |
| 1954 | 50–59 | 30–39 | 40–49 |
| 1955 | 50–59 | 30–39 | 40–49 |

TABLE V — *Daily Average Number of Patients: Cancer*

| | Male | | Female | | Total |
|---|---|---|---|---|---|
| | No. | % | No. | % | |
| 1950 | 15 | 46.9 | 17 | 53.1 | 32 |
| 1951 | 16 | 47.0 | 18 | 52.9 | 34 |
| 1952 | 16 | 47.0 | 18 | 52.9 | 34 |
| 1953 | 17 | 50.0 | 17 | 50.0 | 34 |
| 1954 | 17 | 47.2 | 19 | 52.8 | 36 |
| 1955 | 15 | 45.4 | 18 | 54.5 | 33 |
| Total | 96 | – | 107 | – | 203 |
| Average | 16.0 | 47.3 | 17.8 | 52.7 | 33.8 |

TABLE VI — *Number of Patients Admitted: Cancer*

| | Male | | Female | | Total |
|---|---|---|---|---|---|
| | No. | % | No. | % | |
| 1950 | 227 | 42.0 | 314 | 58.0 | 541 |
| 1951 | 335 | 48.5 | 356 | 51.5 | 691 |
| 1952 | 422 | 51.0 | 405 | 49.0 | 827 |
| 1953 | 400 | 48.8 | 419 | 51.2 | 819 |
| 1954 | 340 | 47.4 | 377 | 52.6 | 717 |
| 1955 | 277 | 40.6 | 406 | 59.4 | 683 |
| Total | 2001 | 46.8 | 2277 | 53.2 | 4278 |

TABLE VII — *Stage of Disease on Admission: Cancer*

| | | Early | | Moderately Advanced | | Advanced | | Non-Malignant | | Total | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | No. | % of Sex | No. | % of Sex | No. | % of Sex | No. | % of Sex | No. | % of Total |
| 1950 | Males | 26 | 17.8 | 19 | 13.0 | 62 | 42.5 | 39 | 26.7 | 146 | 40.9 |
| | Females | 31 | 14.7 | 16 | 7.6 | 77 | 36.5 | 87 | 41.2 | 211 | 59.1 |
| | Total | 57 | 16.0 | 35 | 9.8 | 139 | 38.9 | 126 | 35.3 | 357 | 100.0 |
| 1951 | Males | 56 | 29.0 | 24 | 12.4 | 64 | 33.2 | 49 | 25.4 | 193 | 45.4 |
| | Females | 55 | 23.7 | 37 | 15.9 | 52 | 22.4 | 88 | 37.9 | 232 | 54.6 |
| | Total | 111 | 26.1 | 61 | 14.4 | 116 | 27.3 | 137 | 32.2 | 425 | 100.0 |
| 1952 | Males | 52 | 24.2 | 35 | 16.3 | 74 | 34.4 | 54 | 25.1 | 215 | 48.1 |
| | Females | 48 | 20.7 | 40 | 17.2 | 54 | 23.3 | 90 | 38.8 | 232 | 51.9 |
| | Total | 100 | 22.4 | 75 | 16.8 | 128 | 28.6 | 144 | 32.2 | 447 | 100.0 |
| 1953 | Males | 58 | 27.6 | 55 | 26.2 | 51 | 24.3 | 46 | 21.9 | 210 | 45.4 |
| | Females | 53 | 21.0 | 58 | 23.0 | 46 | 18.2 | 95 | 37.7 | 252 | 54.5 |
| | Total | 111 | 24.0 | 113 | 24.4 | 97 | 21.0 | 141 | 30.5 | 462 | 100.0 |
| 1954 | Males | 52 | 26.9 | 44 | 22.8 | 43 | 22.3 | 54 | 28.0 | 193 | 46.7 |
| | Females | 55 | 25.0 | 49 | 22.3 | 23 | 10.4 | 93 | 42.3 | 220 | 53.3 |
| | Total | 107 | 25.9 | 93 | 22.5 | 66 | 16.0 | 147 | 35.6 | 413 | 100.0 |
| 1955 | Males | 51 | 32.9 | 49 | 31.6 | 24 | 15.5 | 31 | 20.0 | 155 | 39.8 |
| | Females | 55 | 23.5 | 74 | 31.6 | 21 | 9.0 | 84 | 35.9 | 234 | 60.2 |
| | Total | 106 | 27.2 | 123 | 31.6 | 45 | 11.6 | 115 | 29.6 | 389 | 100.0 |
| 1950 to 1955 | Males | 295 | 26.5 | 226 | 20.3 | 318 | 28.6 | 273 | 24.6 | 1112 | 44.6 |
| | Females | 297 | 21.5 | 274 | 19.8 | 273 | 19.8 | 537 | 38.9 | 1381 | 55.4 |
| | Total | 592 | 23.7 | 500 | 20.0 | 591 | 23.7 | 810 | 32.5 | 2493 | 100.0 |

TABLE VIII — *Condition on Discharge: Cancer*

| | Improved | | | | | | Unimproved | | | | | | Dead | | | | | | Total Discharged | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Male | | Female | | Total | | Male | | Female | | Total | | Male | | Female | | Total | | Male | | Female | | Total |
| | No. | % of Total Male | No. | % of Total Female | No. | % of Total | No. | % of Total Male | No. | % of Total Female | No. | % of Total | No. | % of Total Male | No. | % of Total Female | No. | % of Total | No. | % of Total Male | No. | % of Total Female | |
| 1950 . . | 159 | 70.0 | 258 | 84.0 | 417 | 78.1 | 29 | 12.8 | 27 | 8.8 | 56 | 10.5 | 39 | 17.2 | 22 | 7.2 | 61 | 11.4 | 227 | 42.5 | 307 | 57.5 | 534 |
| 1951 . . | 200 | 59.9 | 253 | 70.1 | 453 | 65.2 | 95 | 28.4 | 82 | 22.7 | 177 | 25.5 | 39 | 11.7 | 26 | 7.2 | 65 | 9.4 | 334 | 48.0 | 361 | 51.9 | 695 |
| 1952 . . | 210 | 50.4 | 260 | 64.5 | 470 | 57.3 | 157 | 37.6 | 115 | 28.5 | 272 | 33.2 | 50 | 12.0 | 28 | 6.9 | 78 | 9.5 | 417 | 50.8 | 403 | 49.1 | 820 |
| 1953 . . | 208 | 51.5 | 263 | 63.1 | 471 | 57.4 | 160 | 39.6 | 128 | 30.7 | 288 | 35.1 | 36 | 8.9 | 26 | 6.2 | 62 | 7.6 | 404 | 49.2 | 417 | 50.8 | 821 |
| 1954 . . | 178 | 52.8 | 251 | 66.9 | 429 | 60.2 | 137 | 40.6 | 97 | 25.9 | 234 | 32.9 | 22 | 6.5 | 27 | 7.2 | 49 | 6.9 | 337 | 47.3 | 375 | 52.7 | 712 |
| 1955 . . | 163 | 57.8 | 276 | 67.2 | 439 | 63.3 | 90 | 31.9 | 119 | 29.0 | 209 | 30.2 | 29 | 10.3 | 16 | 3.9 | 45 | 6.5 | 282 | 40.7 | 411 | 59.3 | 693 |
| Total . . | 1118 | 55.9 | 1561 | 68.6 | 2679 | 62.7 | 668 | 33.4 | 568 | 25.0 | 1236 | 28.9 | 215 | 10.7 | 145 | 6.4 | 360 | 8.4 | 2001 | 46.8 | 2274 | 53.2 | 4275 |

# PONDVILLE HOSPITAL

## TABLE I — *Daily Average Number of Patients: Cancer*

| | Male | | Female | | Total |
|---|---|---|---|---|---|
| | No. | % | No. | % | |
| 1950 | 32.1 | 53.0 | 28.4 | 46.9 | 60.5 |
| 1951 | 28.7 | 49.6 | 29.2 | 50.4 | 57.9 |
| 1952 | 31.0 | 49.4 | 31.8 | 50.6 | 62.8 |
| 1953 | 32.9 | 46.3 | 38.2 | 53.7 | 71.1 |
| 1954 | 36.8 | 41.2 | 52.5 | 58.8 | 89.3 |
| 1955 | 43.3 | 47.3 | 48.3 | 52.7 | 91.6 |
| Average | 34.1 | 47.2 | 38.1 | 52.8 | 72.2 |

## TABLE II — *Patients Admitted: Cancer*

| | Male | | Female | | Total |
|---|---|---|---|---|---|
| | No. | % | No. | % | |
| 1950 | 398 | 40.5 | 584 | 59.5 | 982 |
| 1951 | 469 | 41.8 | 653 | 58.2 | 1122 |
| 1952 | 589 | 44.2 | 745 | 55.8 | 1334 |
| 1953 | 540 | 42.8 | 721 | 57.2 | 1261 |
| 1954 | 554 | 39.8 | 837 | 60.2 | 1391 |
| 1955 | 616 | 39.3 | 951 | 60.7 | 1567 |
| Total | 3166 | 41.3 | 4491 | 58.6 | 7657 |

## TABLE III — *Stage of Disease on Admission: Cancer*

| | | Early | | Moderately Advanced | | Advanced | | Non-Malignant | | Unknown | | Total | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Sex | No. | % of Sex | No. | % of Sex | No. | % of Sex | No. | % of Sex | No. | % of Sex | No. | % of Total for Yr. |
| 1950 | Males | 30 | 11.7 | 88 | 34.4 | 81 | 31.6 | 57 | 22.3 | 0 | 0.0 | 256 | 41.0 |
| | Females | 46 | 12.5 | 77 | 20.9 | 61 | 16.6 | 184 | 50.0 | 0 | 0.0 | 368 | 59.0 |
| | Total | 76 | 12.2 | 165 | 26.4 | 142 | 22.8 | 241 | 38.6 | 0 | 0.0 | 624 | 100 |
| 1951 | Males | 33 | 12.4 | 64 | 24.0 | 106 | 39.7 | 57 | 21.3 | 7 | 2.6 | 267 | 41.9 |
| | Females | 20 | 5.4 | 78 | 21.1 | 94 | 25.4 | 176 | 47.6 | 2 | 0.5 | 370 | 58.1 |
| | Total | 53 | 8.3 | 142 | 22.3 | 200 | 31.4 | 233 | 36.6 | 9 | 1.4 | 637 | 100 |
| 1952 | Males | 36 | 11.8 | 127 | 41.5 | 52 | 17.0 | 84 | 27.4 | 7 | 2.3 | 306 | 41.9 |
| | Females | 41 | 9.6 | 132 | 31.0 | 53 | 12.5 | 191 | 44.9 | 8 | 1.9 | 425 | 58.1 |
| | Total | 77 | 10.5 | 259 | 35.4 | 105 | 14.4 | 275 | 37.6 | 15 | 2.0 | 731 | 100 |
| 1953 | Males | 30 | 9.9 | 80 | 26.4 | 110 | 36.3 | 72 | 23.8 | 6 | 2.0 | 303* | 42.9 |
| | Females | 41 | 10.2 | 66 | 16.4 | 127 | 31.5 | 160 | 39.7 | 3 | 0.7 | 403* | 57.1 |
| | Total | 71 | 10.1 | 146 | 20.7 | 237 | 33.6 | 232 | 32.9 | 9 | 1.3 | 706* | 100 |
| 1954 | Males | 36 | 12.4 | 59 | 20.4 | 114 | 39.4 | 67 | 23.2 | 9 | 3.1 | 289† | 39.0 |
| | Females | 64 | 14.2 | 58 | 12.8 | 124 | 27.4 | 189 | 41.8 | 6 | 1.3 | 452† | 61.0 |
| | Total | 100 | 13.5 | 117 | 15.8 | 238 | 32.1 | 256 | 34.5 | 15 | 2.0 | 741† | 100 |
| 1955 | Males | 36 | 10.2 | 52 | 14.7 | 164 | 46.3 | 88 | 24.8 | 9 | 2.5 | 354† | 43.6 |
| | Females | 37 | 8.1 | 78 | 17.1 | 134 | 29.3 | 194 | 42.4 | 7 | 1.5 | 457† | 56.4 |
| | Total | 73 | 9.0 | 130 | 16.0 | 298 | 36.7 | 282 | 34.8 | 16 | 2.0 | 811‡ | 100 |
| 1950 to 1955 | Males | 201 | 11.3 | 470 | 26.5 | 627 | 35.3 | 425 | 23.9 | 38 | 2.1 | 1775 | 41.8 |
| | Females | 249 | 10.1 | 489 | 19.8 | 593 | 24.0 | 1094 | 44.2 | 26 | 1.0 | 2475 | 58.2 |
| | Total | 450 | 10.6 | 959 | 22.6 | 1220 | 28.7 | 1519 | 35.7 | 64 | 1.5 | 4250 | 100 |

*Including "post-therapy, no recurrence": 5 males, 6 females.
†Including "no disease": 4 males, 11 females.
‡Including "no disease, or no recurrence": 5 males, 7 females.

## TABLE IV — *Condition on Discharge: Cancer*

| | Improved | | | | | Unimproved | | | | | Dead | | | | | Total Discharged | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Male | | Female | | Total | Male | | Female | | Total | Male | | Female | | Total | Male | | Female | | Total |
| | No. | % of Total Male | No. | % of Total Female | No. % of Total | No. | % of Total Male | No. | % of Total Female | No. % of Total | No. | % of Total Male | No. | % of Total Female | No. % of Total | No. | % of Total Male | No. | % of Total Female | |
| 1950 | 277 | 73.3 | 463 | 79.3 | 740 76.9 | 79 | 20.9 | 88 | 15.1 | 167 17.4 | 22 | 5.8 | 33 | 5.6 | 55 5.7 | 378 | 39.3 | 584 | 60.7 | 962 |
| 1951 | 322 | 67.2 | 510 | 78.2 | 832 73.6 | 93 | 19.4 | 112 | 17.2 | 205 18.1 | 64 | 13.4 | 30 | 4.6 | 94 8.3 | 479 | 42.4 | 652 | 57.6 | 1131 |
| 1952 | 387 | 66.7 | 587 | 80.1 | 974 74.2 | 122 | 21.0 | 93 | 12.7 | 215 16.4 | 71 | 12.2 | 53 | 7.2 | 124 9.4 | 580 | 44.2 | 733 | 55.8 | 1313 |
| 1953 | 385 | 71.7 | 551 | 76.7 | 936 74.6 | 90 | 16.8 | 116 | 16.2 | 206 16.4 | 62 | 11.5 | 51 | 7.1 | 113 9.0 | 537 | 42.8 | 718 | 57.2 | 1255 |
| 1954 | 357 | 63.9 | 598 | 72.7 | 955 69.2 | 114 | 20.4 | 143 | 17.4 | 257 18.6 | 88 | 15.7 | 81 | 9.8 | 169 12.2 | 559 | 40.5 | 822 | 59.5 | 1381 |
| 1955 | 415 | 67.9 | 715 | 74.4 | 1130 71.9 | 101 | 16.5 | 151 | 15.7 | 252 16.0 | 95 | 15.5 | 95 | 9.9 | 190 12.1 | 611 | 38.9 | 961 | 61.1 | 1572 |
| Total | 2143 | 68.2 | 3424 | 76.6 | 5567 73.1 | 599 | 19.0 | 703 | 15.7 | 1302 17.1 | 402 | 12.8 | 343 | 7.7 | 745 9.8 | 3144 | 41.3 | 4470 | 58.7 | 7614 |

## TABLE V — *Median Age of Patients Admitted: Cancer*

| | Male | Female | Total |
|---|---|---|---|
| 1950 | 60–69 | 50–59 | 50–59 |
| 1951 | 60–69 | 50–59 | 60–69 |
| 1952 | 60–69 | 50–59 | 60–69 |
| 1953 | 60–69 | 50–59 | 60–69 |
| 1954 | 60–69 | 50–59 | 60–69 |
| 1955 | 60–69 | 50–59 | 60–69 |

# BUREAU OF ENVIRONMENTAL SANITATION

## DIVISION OF SANITARY ENGINEERING

The work of the Division of Sanitary Engineering is carried out under four principal engineering sections and the Lawrence Experiment Station. The engineering sections consist of the water supply section, community sanitation section, atmospheric pollution and radiological health section, and pollution control section; under the community sanitation section are carried out the sanitary engineering activities of the four public health districts. At the Lawrence Experiment Station routine work is carried out in the chemical laboratory and the bacteriological laboratory, with a separate laboratory for research. The facilities of the chemical and bacteriological laboratories are available to the research laboratory. In addition to these three laboratories, the plumbing research laboratory recently established is engaged in the demonstration of the hydraulics of plumbing and the training of plumbers and plumbers' apprentices in the health features of plumbing; in this connection the trainees are afforded a general knowledge of the operation of the other sections of the Lawrence Experiment Station to emphasize the health features of proper plumbing.

In addition, to serve the western part of the State in special sanitary engineering activities, there is the Amherst laboratory at the headquarters of the Western Public Health District.

The following detailed report is arranged for the discussion of each of the several sections referred to above.

### Routine Work

The routine activities of the Division of Sanitary Engineering have been as follows:

General advice to cities, towns and persons in matters of water supply, drainage, sewerage and sewage disposal.

Investigations leading to the adoption of rules and regulations for protecting sources of water supply and enforcement of such rules and regulations.

Investigations leading to removal of sources of pollution of water supplies.

Investigations relative to the efficiency of the operation of sewage treatment works.

Investigations relative to pollution of streams, examinations of sewer outlets, enforcement of legislation relating to pollution of certain streams and certain coastal waters.

Investigations relative to the use of emergency sources of water supply.

Approval of the acquisition of lands for protecting sources of water supply and lands for sewage treatment works.

Investigations as to effect of industrial wastes on sewers and sewage treatment works.

Investigations leading to approval of plans for police stations, lockups and houses of detention.

Investigations relative to offensive trades.

Investigations relative to the approval of the use of lands for cemetery purposes and for the construction of mausoleums and crematories.

Investigations leading to advice to cities, towns and persons in matters of bathing places, garbage and refuse disposal, nuisances, private water supplies and similar problems.

Investigations relative to sources of water supply where the water is bottled and sold or used in the manufacture of non-alcoholic beverages.

Investigations relative to pollution of water supplies by cross connections.

Investigations as to the location of public institutions.

Preparation of plans for water supply and sewerage for institutions of the Department and certain other State institutions.

Approval of municipal plumbing rules and regulations.

Investigations relative to the pollution of coastal waters from which shellfish are taken.

Investigations relative to sanitary conditions of shellfish-handling establishments and consideration of certificates of out-of-state shellfish shippers.

Investigations relative to the approval of shellfish purification plants and the operation thereof.

Representatives of the Division have participated in the Sanitation Courses at the University of Massachusetts. The work has included lectures, field trips and assistance to the faculty in the preparation of courses.

Representatives of the Division have from time to time given lectures on general sanitation matters at various hospitals throughout the State to classes of nurses in training.

Papers on the problem and solution of stream pollution have been presented to many civic and professional organizations throughout the State by engineers of this Division.

General advice to the Legislature in matters of water supply, drainage, sewerage and sewage disposal, shellfish and other environmental sanitation problems.

A representative of the Division of Sanitary Engineering has been appointed by the Commissioner of Public Health as a member of the State Reclamation Board, whose duties at present are largely concerned with the control of mosquitoes.

A representative of the Division of Sanitary Engineering also is appointed to represent the Commissioner of Public Health on the Water Resources Commission.

Changes in the law placed upon the Division of Sanitary Engineering the duty of making investigations relative to atmospheric pollution, and included within the Division the Division of Smoke Inspection for Smoke Inspection Districts.

With the release of radioisotopes to industry, hospitals and others under license by the Atomic Energy Commission, the Department of Public Health was given the duty of the control of the use of radioactive materials in Massachusetts, this duty being assigned within the Department to the Division of Sanitary Engineering.

The Division has been actively concerned in the location and condition of operation of municipal dumps, particularly in the city of Boston. A new law permits any person aggrieved by the assignment of the location of a dump by a local board of health to apply to the Department of Public Health for a hearing; following the hearing the Department may revoke or amend the assignment by the local board of health.

The Division has also been concerned in the examination of and advice relative to piggeries at the request of local boards of health.

## Special Activities

*Legislative Investigations*

This Division has assisted in special investigations directed by the resolves of the Legislature during the period from 1949 to 1956.

*Water Resources Board*

A representative of the Division of Sanitary Engineering has been appointed to represent the Commissioner of Public Health on this Board, which was organized in 1956.

*State Reclamation Board*

During the six-year period covered by this report the State Reclamation Board, composed of a representative of the Department of Public Health, a representative of the Department of Agriculture and a person appointed by the Governor,

has held its regular meetings each month at which problems concerned with the maintenance of the salt marsh ditches, the operation of the mosquito control districts and the greenhead fly districts have been discussed and appropriate action taken whenever necessary.

During this period Chapter 433 of the Acts of 1955 was passed in amendment of Chapter 252 of the General Laws for the creation of a Greenhead Fly Control District in which the Commonwealth shares the cost to the extent of one-third based on the area of the communities involved. Two new mosquito control districts were authorized during this period. The Norfolk County Mosquito Control District was created under the authority of Chapter 431 of the Acts of 1956 and was in operation soon after approval of the act by the Governor. The Bristol County Mosquito Control District was authorized by Chapter 506 of the Acts of 1956 but never has been organized.

*Civil Defense*

July 1, 1950, to June 30, 1951

On July 20, 1950, His Excellency, the Governor, approved Chapter 639 of the Acts of 1950, which provided for a Civil Defense Agency in Massachusetts, which agency was activated by the Governor's Executive Order on August 18, 1950; and on December 16, 1950, the Governor proclaimed a state of emergency.

The Civil Defense Agency was organized in seven divisions including the Medical and Health Division. That Division was organized with 12 sections, one of which was the Environmental Sanitation Section. Under the general organization the State was divided into nine regions. The Division of Sanitary Engineering staffed State Headquarters and each regional headquarters with sanitary engineering personnel to operate in disaster under the Regional Medical Officers.

July 1, 1951, to June 30, 1952

The Environmental Sanitation Section held water works schools in September, October and November, 1951, in each of the nine regions. These schools were well attended by local water works personnel who were instructed in the use of emergency water chlorination apparatus and as to examination and selection of proper emergency sources of water supply should the public supplies be severely damaged.

In March, April and May of 1952 general sanitation schools also were held in each of the nine Civil Defense Regions.

July 1, 1952, to June 30, 1953

During this period all public water supply agencies were canvassed to determine the amount of emergency water supply equipment. This equipment was listed according to various types and also as to the regions in which it was located to facilitate its dispatch from one region to another.

During this period also manuals were prepared showing:

(1) The duties and organization of the Environmental Sanitation Section.
(2) Emergency Sanitation — Water Supply.
(3) Emergency Sanitation — Decontamination of areas affected by biological, chemical, gaseous and radiological sabotage or attack.
(4) Emergency Sanitation — General Sanitation.
(5) Milk and food sanitation, household supplies, mass feeding.

During this period also information was obtained as to local water works personnel and tabulations prepared showing those in charge of local public water supplies together with their office and home addresses.

Water treatment training equipment was purchased under matching funds including diatomaceous earth filters, pumps, canvass storage tanks and appurtenances for use in future water works schools.

On June 9, 1953, the Worcester tornado occurred and the Environmental Sanitation Section concentrated its field engineers in the Worcester area to assist in

water supply problems and to determine the amount of damage to water works. This included examinations in the city of Worcester and in the towns of Petersham, Barre, Holden, Rutland, Shrewsbury, Northborough, Westborough and Southborough and at the Rutland State Sanatorium of the Department of Public Health. The damage consisted of breaks in house services in damaged areas and loss of electric power. Adequate amounts of water were in storage on public water supply distribution systems so that early repair of power lines solved the problem of adequate water supply. In one instance, however, in the town of Northborough, the power failure made it impractical to operate the pumps and emergency pumps were obtained from the list of emergency equipment previously prepared by the section. In addition to examination of water supplies in the Worcester area examinations were made of the facilities for emergency feeding. No unsanitary practices were observed.

During this period also training in radiological monitoring was carried on by the Monitoring Section to which an engineer from the Division of Sanitary Engineering had been assigned. Regional monitoring consultants were trained in the use of monitoring equipment, and field exercises were carried out in the training of monitoring teams.

July 1, 1953, to June 30, 1954

During this period the Environmental Sanitation Section attended Civil Defense exercises at Civil Defense Headquarters at the Framingham State Police Training School in September, November and December, 1953, and on January 4, 1954.

In addition, on January 4, 1954, the Environmental Sanitation Section lectured at a meeting of the Massachusetts Public Health Association in Worcester to explain the functions of the Environmental Sanitation Section in Civil Defense.

On June 14 and 15, 1954, Operation Alert 1954 was held at Civil Defense Headquarters. The State and Regional Headquarters were staffed for this exercise by the Environmental Sanitation Section under the Medical Services.

July 1, 1954, to June 30, 1955

The Environmental Sanitation Section was called into service on August 31, 1954, with the appearance of Hurricane Carol and again on September 11, 1954, with the occurrence of Hurricane Edna.

On January 3, 1955, the Civil Defense Agency was reorganized. Under Executive Order No. 25 and Administrative Order No. 23, as amended, the Water Service was removed from the Medical Service and placed in charge of the Division of Sanitary Engineering of the Department of Public Health, the Chief Sanitary Engineer being appointed as Chief Water Officer. Under the reorganization the former nine regions were done away with and the State was redivided into four civil defense areas. The State Headquarters and each of the areas were staffed three-deep with waterworks personnel under the Chief Water Officer. The Sanitation Section under the Medical Service was also staffed for duty at the State and area headquarters in case of emergency.

The personnel of the Division of Sanitary Engineering in the Water Service and in the Sanitation Section of the Medical Service took part in Operation Alert 1955 on June 15 and 16, 1955.

July 1, 1955, to June 30, 1956

During this period whenever possible the Division of Sanitary Engineering in the two services attended weekly conferences at State Headquarters. The staff of the Division of Sanitary Engineering under the Water Service prepared maps showing present public water supplies in Massachusetts, rearranged according to Civil Defense areas the tabulation of emergency water supply equipment, prepared a complete revision of the listing of public water supply personnel and prepared a new manual of emergency water supply.

Again, in 1955, Massachusetts was visited by three hurricanes; on August 13 by "Connie," on August 17–19 by torrential rains accompanying Hurricane Diane

and by heavy rains occurring in October in company with Hurricane Edna. The torrential rains in August resulted in major damage in the central portion of the State and the Connecticut River Valley. The Division of Sanitary Engineering personnel assigned to the Water Service and Medical Service were in the field much of this time advising as to the rehabilitation of public water supplies and the eradication of nuisance conditions.

Operation Alert was planned for June, 1956, but was postponed to July 20 and 23, 1956.

Prior to Operation Alert 1956, a test was conducted on a token evacuation of Beacon Hill to the Framingham area.

## Water Supply Section

*Special Activities*

During the post-war years the Water Supply Section took part in activities sponsored by the Massachusetts Civil Defense Agency. Following a reorganization of that agency a new section known as "Water Service" was established with a representative of this Division designated as Chief of that section. Several training schools have been conducted for water supply personnel throughout the State in an endeavor to work out a program to be used in the event of disaster, either by natural causes or by enemy action.

In 1954, two natural disasters occurred, the hurricane of August 31 and that of September 11. These both caused considerable damage to water supply installations. Many communities were without power for several days. The storms demonstrated the necessity of auxiliary pumping equipment for sources of supply which were supplied only with electric power. The personnel of the Division was on 24-hour standby duty during both disasters. Laboratory facilities were taxed and a large number of special samples were examined to determine that none of the public water supplies had become polluted.

In 1955, serious flooding occurred over a large part of the State as a result of heavy rainfall accompanying hurricane Diane in August. Damage to public water supplies, as a result of these floods, in the lower Connecticut River Valley exceeded $1,000,000. The damage to water supply systems throughout the State brought the total damage to about $2,500,000. During the flood and the rehabilitation following it, the Division assisted the damaged communities in providing safe water supplies by the installation of chlorinating apparatus and the transportation of water for drinking. Close contact was maintained with the Flood Relief Board in connection with the repair of damage to water supply systems.

*Water Shortages*

Following the severe drought of the year 1949, steps were taken by many communities to develop additional sources of water supply to meet increased water needs. However, shortages continued at a lesser rate during the years 1950–56, and in many instances the provisions of General Laws, Chapter 40, Section 41A, were invoked to give the right to public water supply agencies to shut off the water to consumers not showing cooperation in water conservation measures.

*Public Water Supplies*

On June 30, 1956, 273 of the 351 cities and towns of the Commonwealth were provided with public water supplies. However, there were 306 agencies engaged in this service, including municipal water departments, water districts, and water companies (Figure 1). There still remained 78 muncipalities not considered as having public water supplies, although in some of these there are public institutions which provide water to patients and employees, accounting for a considerable portion of the population of these communities. About 98 per cent of the population of Massachusetts reside in communities having public water supplies.

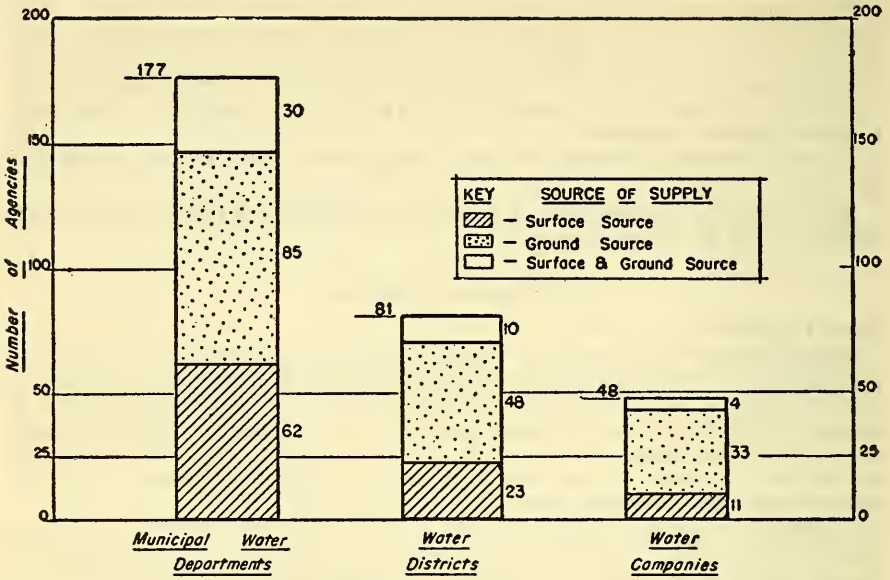


FIGURE 1
Water Supply Agencies by Type and Source

The growth of public water supply service in Massachusetts from 1870 to 1955 is shown in Figure 2.

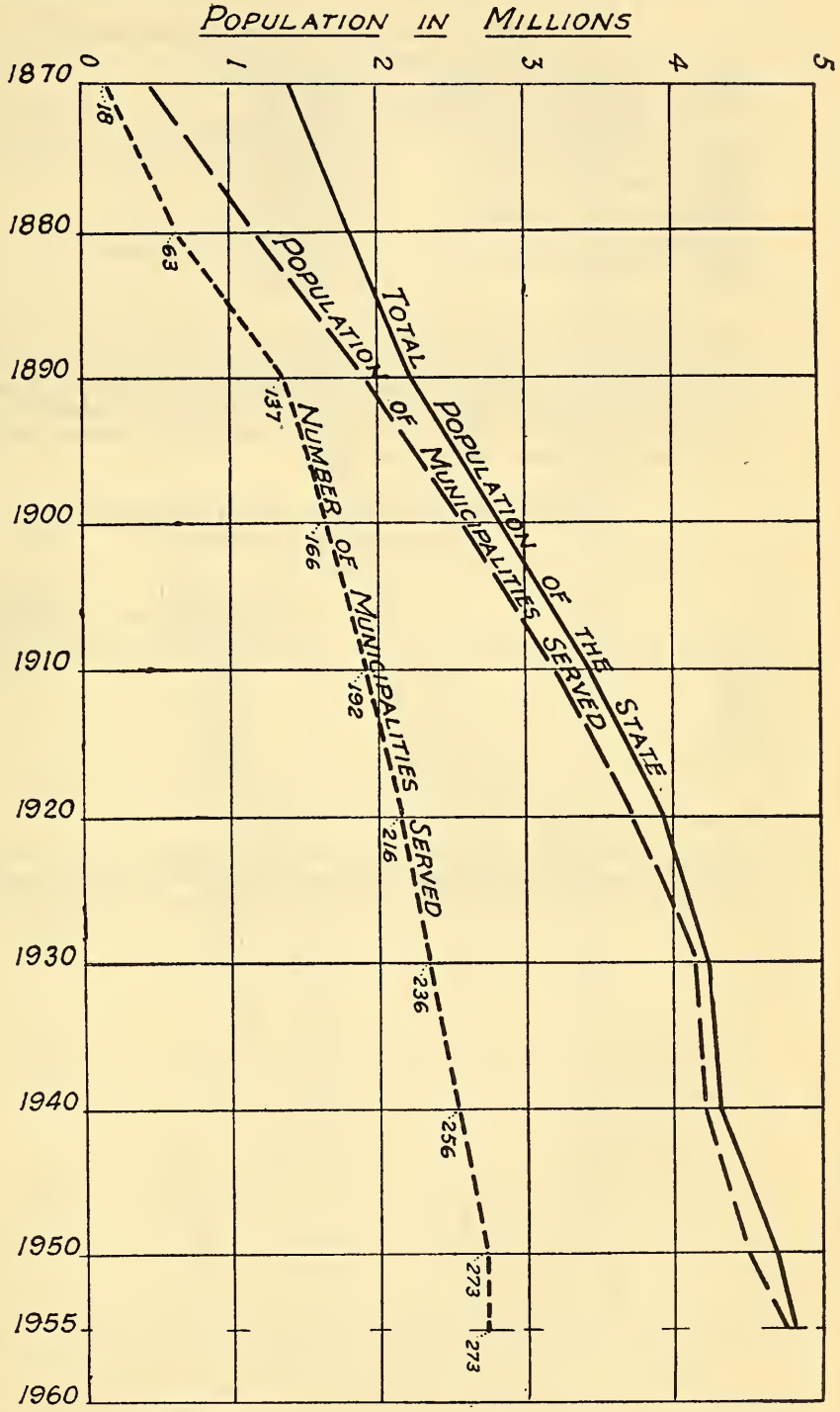


FIGURE 2
Population and Number of Municipalities with Public Water Supplies
1870–1955

The following tabulation shows the public water supply systems which were established during the years 1950 through 1956:

RECENT ESTABLISHMENT OF PUBLIC WATER SUPPLIES

| | | |
|---|---|---|
| Boylston — Morningdale Water District | Gravel-packed well | 1950 |
| Burlington — Burlington Water District | Tubular wells | 1950 |
| Raynham — North Raynham Water District | Tubular wells | 1950 |
| Raynham Center Water District | City of Taunton Supply | 1950 |
| Sutton — Manchaug Water District | Stevens Pond (tests for ground water supply) | 1950 |
| Swansea — Swansea Water District | Gravel-packed wells | 1950 |
| Templeton | Gravel-packed well | 1950 |
| Dighton — Dighton Water District | Tubular wells | 1951 |
| Blackstone | Gravel-packed wells | 1952 |
| Boylston — Boylston Water District | Gravel-packed wells | 1952 |
| Tewksbury | Gravel-packed wells | 1952 |
| North Reading | Gravel-packed and tubular wells | 1954–1955 |
| Leicester — Hillcrest Water District | Drilled well | 1955 |
| Norwell | Gravel-packed well | 1956 |

The availability of sources of water supply of the Metropolitan District Commission has resulted in the towns of Brookline and Marblehead, the city of Newton, the Lynnfield Water District, and the South Hadley Fire District No. 1 abandoning their local sources and obtaining water from the Metropolitan District Commission. The following tabulation shows the number of additions to existing water supply sources during the years 1950 through 1956.

CLASSIFICATION OF SOURCE OF SUPPLY FOR ADDITIONS TO EXISTING WATER SYSTEMS

| Year | No. of Additional Ground Water Sources Developed | No. of Additional Surface Water Sources Developed (Artificial Reservoirs) |
|---|---|---|
| 1950 | 16 | – |
| 1951 | 14 | 2 |
| 1952 | 5 | – |
| 1953 | 24 | 1 |
| 1954 | 19 | 2 |
| 1955 | 21 | 1 |
| 1956 | 17 | 1 |

*Consumption of Water*

Figure 3 shows the estimated total water consumption of the Metropolitan District Commission and all the public water supplies in the State, together with the estimated total of the safe yield of all the present sources of water supply.

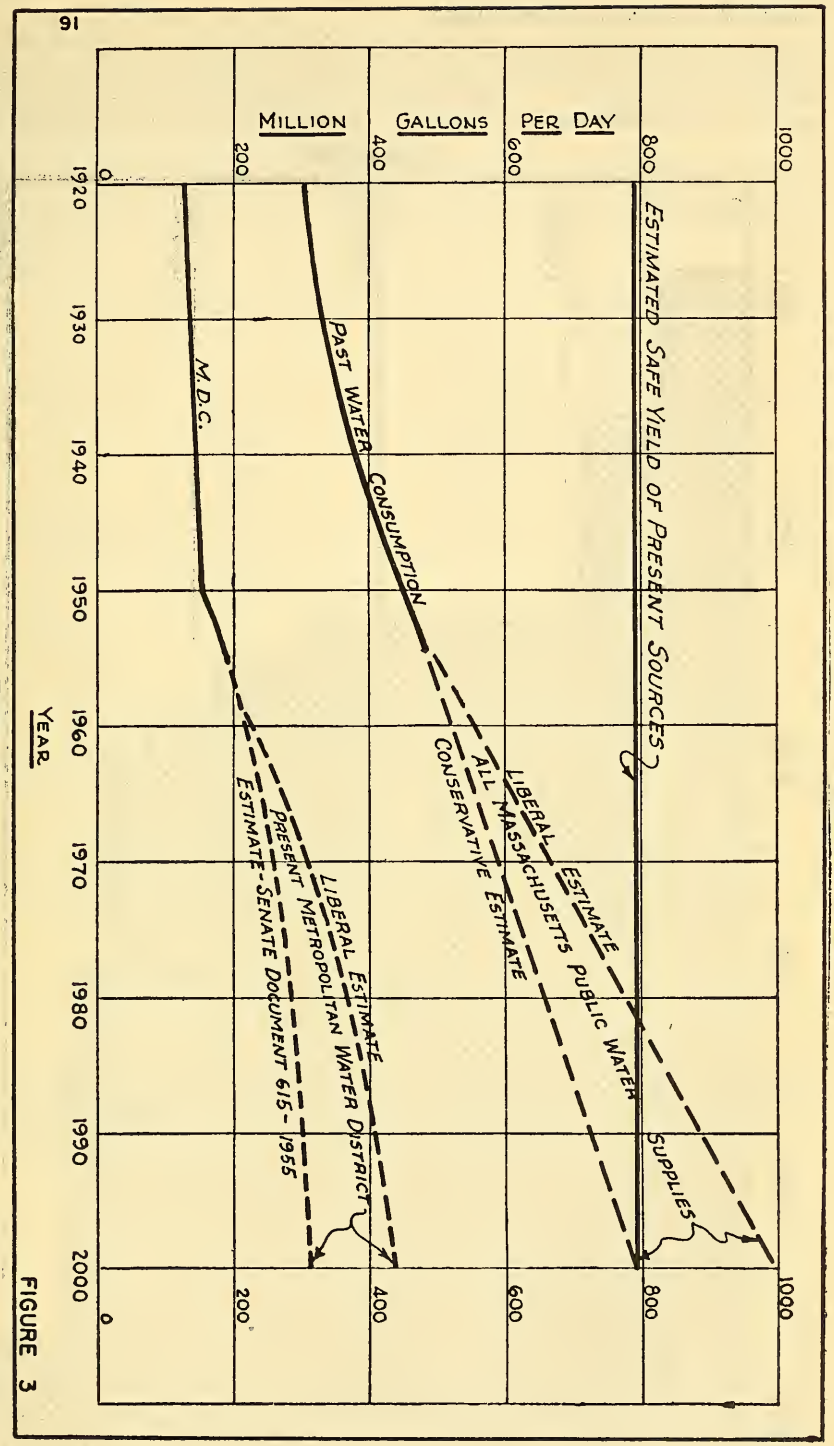


FIGURE 3

Figure 3
Total Water Consumption and Safe Yields (Estimated)

*Fluoridation of Public Water Supplies*

The water supplies of Massachusetts are deficient in the amount of fluorides necessary to prevent excessive dental caries, and following the recommendations of the Department some 20 communities now treat their water supplies by the addition of a fluoride compound to bring the fluoride content to an optimum value

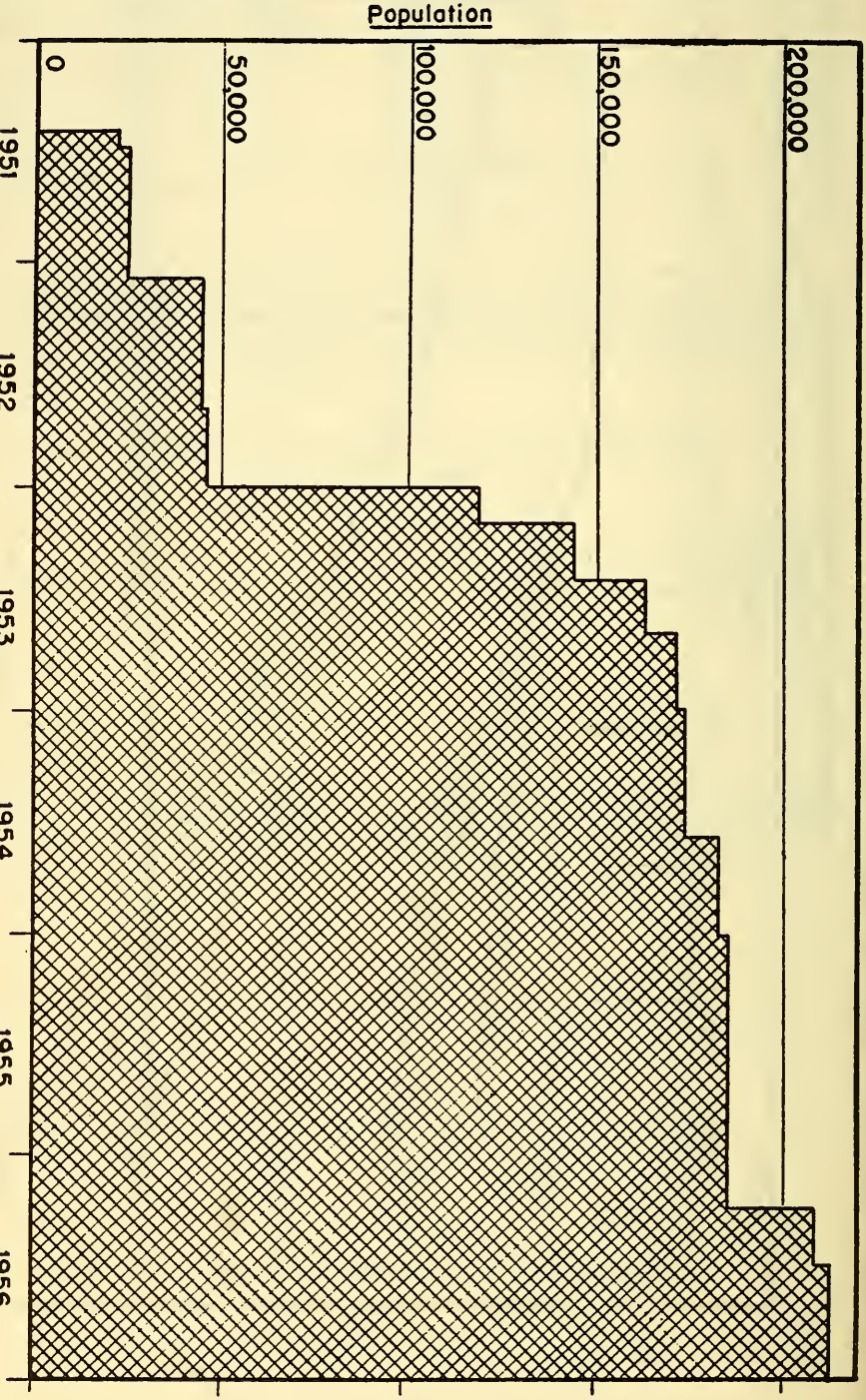


FIGURE 4
Fluoridation of Public Water Supplies

of one part per million. In spite of the fact that the city of Northampton and the towns of Hudson and Williamstown adopted a fluoridation program and later abandoned it by vote, there has been a steady although rather slow increase in the population served with fluoridated water (Figure 4).

*Climatological Data: Precipitation*

The average annual rainfall in Massachusetts has been well above normal in all but two years of the period 1950–1955 (Figure 5). The total rainfall excess for the six-year period amounted to 27.56 inches, or about half of the normal annual precipitation.

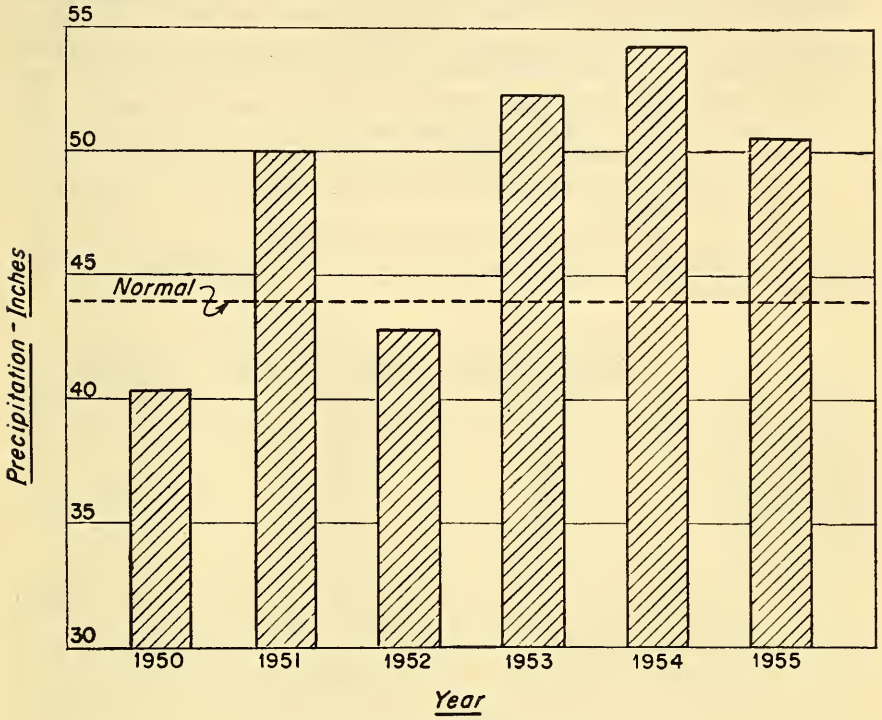


FIGURE 5
Precipitation in Massachusetts, 1950–1955

The following table shows the normal monthly rainfall as deduced from the records of seven long-term stations located at Amherst, Boston, Dalton, Fitchburg, Lowell, New Bedford and Northbridge; also, the monthly rainfall for the years 1950–1955, inclusive:

MONTHLY RAINFALL IN INCHES FOR YEARS 1950–1955

| Month | Normal | 1950 | 1951 | 1952 | 1953 | 1954 | 1955 |
|---|---|---|---|---|---|---|---|
| January | 3.59 | 4.39 | 3.61 | 4.66 | 6.23 | 2.69 | 0.88 |
| February | 3.33 | 3.87 | 4.64 | 3.64 | 3.49 | 2.66 | 3.71 |
| March | 3.84 | 3.64 | 4.89 | 3.64 | 8.60 | 3.58 | 4.24 |
| April | 3.63 | 3.32 | 3.24 | 4.21 | 6.16 | 4.68 | 3.92 |
| May | 3.64 | 2.54 | 4.26 | 4.22 | 4.77 | 7.37 | 1.63 |
| June | 3.50 | 2.59 | 3.03 | 3.93 | 1.55 | 3.02 | 3.42 |
| July | 3.76 | 2.27 | 3.99 | 2.01 | 3.12 | 2.83 | 2.26 |
| August | 4.15 | 3.57 | 3.57 | 6.20 | 2.32 | 5.53 | 13.57 |
| September | 3.56 | 1.71 | 2.42 | 2.96 | 1.78 | 8.17 | 2.58 |
| October | 3.49 | 2.16 | 4.44 | 1.21 | 5.18 | 2.84 | 8.41 |
| November | 3.89 | 6.49 | 7.04 | 2.20 | 4.36 | 5.91 | 4.80 |
| December | 3.58 | 3.88 | 4.86 | 3.94 | 4.72 | 4.99 | 1.07 |
| Totals | 43.96 | 40.43 | 49.99 | 42.82 | 52.28 | 54.27 | 50.49 |

*Cross Connections*

The cross-connection program of the Department operates under the authority of Section 160, Chapter 111 of the General Laws of the State. The rules and regulations pertaining to cross connections were originally adopted on February 9, 1937. They were amended on May 12, 1942, to facilitate the successful prosecution of the war effort. After the national emergency was over the rules and regulations were readopted in their original form on February 8, 1949. On October 9, 1951, the rules and regulations were revised once more so that they continued in their primary purpose of protecting the public water supply and yet gave the Department more discretionary power to allow properly constructed and properly protected cross connections where it was felt that the public good would be served.

In essence the new rules and regulations forbid the physical cross connection of any other water supply with the distribution system of a public water supply unless:

(a) The secondary water is proved to be of safe and sanitary quality.

(b) The connection includes adequate backflow preventive devices such as check valves, properly installed so that they may be tested.

(c) The entire design and installation meets the approval of the Department of Public Health.

The following table shows the distribution and number of approved double-check valve installations which have been permitted in accordance with these rules and regulations.

| Period Ending | Number of Municipalities having Industrial Plants with Double-Check Valve Installations | Number of Industrial Plants having Double-Check Valve Installations | Number of Sets of Active Double-Check Valve Installations in State |
|---|---|---|---|
| December 31, 1949 | 134 | 659 | 1004 |
| December 31, 1950 | 134 | 650 | 1005 |
| December 31, 1951 | 133 | 650 | 999 |
| December 31, 1952 | 134 | 654 | 1002 |
| December 31, 1953 | 134 | 634 | 980 |
| December 31, 1954 | 132 | 628 | 988 |
| December 31, 1955 | 129 | 619 | 989 |
| December 31, 1956 | 130 | 616 | 993 |

Like all mechanical devices, check valves are subject to failure, and to minimize the dangers inherent in faulty checks the Department requires periodic inspections. The Department has endeavored to educate the local water companies to allow at least one man to become familiar with the testing and overhauling of the check valve installations within their district and to have this designated individual make routine inspections every three months. This individual would make out regular inspection forms and send the Department a copy so that it would be informed at all times. If any check valves were found to be faulty or in need of repair the matter could be attended to immediately.

Once each year an engineer from the Department visits each plant and supervises the testing and overhauling of the check valve installations. Iron-bodied check valves (a type no longer permitted under the Department's rules) are opened at the annual inspection every year, whether they hold or not, and are thoroughly reconditioned. Bronze-bodied check valves are tested for tightness and if they work properly are not usually opened for inspection. Once every five years, however, the bronze-bodied checks are opened for a complete overhauling, cleaning and lubrication.

Within the last few years the Department has embarked upon a program of replacing the hard-rubber discs, usually supplied as standard equipment with the check valves, with a disc made of a softer, more pliable rubber. These softer discs seem to work much better and they substantially reduce the number of small installations which fail to meet the initial test for tightness. In addition, the Department has published informative and descriptive literature for distribution to water supply officials, plant mechanics in charge of double-check valves, and other interested persons.

Illegal and/or improperly protected cross connections constitute a public health menace whose potential danger cannot be minimized. It is encouraging to note that since the inception of the law relating to cross connections in 1937 there have been no known cases of sickness or disease traceable to a cross connection approved and regularly inspected by a Department engineer.

## Community Sanitation

*Camp Sanitation*

During this seven-year period this Division has continued to make examinations of recreational camps, overnight camps or motels and trailer coach parks under authority of Sections 32 B-L of Chapter 140 of the General Laws as amended.

This law requires the board of health to license annually those camps and parks which come under the provisions of the law. The law further specifies that the Department shall be notified of the granting of such licenses and shall have jurisdiction to examine water supplies and methods of sewage disposal.

Since 1939, the camp law has been amended as follows:

Chapter 396 of 1941
Chapter 153 of 1945
Chapters 326 and 802 of 1950
Chapter 74 of 1951
Chapter 583 of 1952
Chapter 130 of 1953
Chapters 134 and 410 of 1954
Chapters 162 and 444 of 1956

As recently as 1940 it was found that only 30 per cent of the recreational camps had satisfactory sources of water supply or methods of sewage disposal or both. In 1952 it was found that the percentage of recreational camps meeting satisfactory standards for water supply and sewage disposal had increased to 70 per cent.

The total number of camps licensed under the provisions of this law has increased steadily since 1949. In 1953, 1,056 camps were examined by the sanitarians and sanitary engineers of this Division.

In recent years because of the increasing number of camps and a smaller staff of sanitarians, it has been necessary to limit the examinations to three classes as follows:

(1) All recreational camps including day camps (350–400 annually)
(2) All new motels, overnight camps and trailer parks or those that have not been previously examined (75–100 annually)
(3) All camps not approved for water supply and sewage disposal following the last examination (35–50 annually)

Bathing places at recreational camps are examined only upon request.

A pamphlet entitled "Camp Sanitation" has been prepared by the Division for the use of local sanitarians and camp operators.

*Housing*

With more communities recognizing the problems of blight and physical decay of substandard areas, it was felt that enabling legislation should be provided so that minimum housing standards could be drafted for municipalities to adopt and to enforce.

Chapter 631 of the Acts of 1947 directed the Department of Public Health to draft regulations establishing minimum standards of fitness of dwellings and also for the Board of Standards in the Department of Public Safety to draw up minimum standards for construction, alteration, repair and use of buildings, with the assistance of the Commissioner of Public Health.

Regulations establishing minimum standards of fitness for human habitation under Section 128 of Chapter 111 were adopted by the Department in 1949. Several communities adopted the minimum standards, but they proved to be difficult to enforce because of the ambiguous wording. During the latter part of this seven-

year period, two new laws, Chapters 209 and 447 of 1954, were passed which repealed Section 128 of Chapter 111 and substituted Sections 128B, 128C, 128D, 128E and 128F. New problems covered by this legislation were home accident prevention and mobile dwelling places.

The new law invalidated the earlier minimum standards. Accordingly, new standards were adopted by the Public Health Council on March 8, 1955, and filed with the Secretary of State on March 22, 1955. Local standards adopted by action of the city council or town meeting under Section 128 also were invalidated, requiring therefore the adoption of new standards. Minimum standards that were adopted under Section 31 of Chapter 111 remain in force.

For the assistance of local boards of health two pamphlets have been prepared by the Division: "Housing Rehabilitation" and "Minimum Standards." The latter pamphlet explains the mechanism by which municipalities may adopt minimum standards relative to housing.

*Refuse and Garbage*

The Department has continued to advise communities relative to the correction of objectionable conditions caused by odors, insects, rodents, smoke and fires at dumps.

The Division also examines proposed refuse disposal sites upon the request of the local boards of health. In 1952 a hearing was held by the Department under Chapter 111, Section 152 of the General Laws following receipt of a petition from residents complaining of insanitary conditions resulting from the operation of an open-face dump. Events following this hearing emphasized the lack of authority on the part of the Department to correct unsatisfactory conditions resulting from the operation of a municipal dump.

The Legislature gave additional authority to the Department under Chapter 310 of the Acts of 1955 to control garbage and refuse disposal in communities. According to this law, no dump or incinerator shall be established or operated "unless such place has been assigned by the board of health of the city or town." The Department shall advise upon the request of any board of health as to the assignment of a place and upon appeal may, "after due notice and public hearing" rescind or suspend such an assignment.

Under the Acts of 1952, Chapter 559, provisions were made for the construction and operation by the Metropolitan District of refuse disposal incinerators. Five such incinerators were to be constructed to serve the Metropolitan area. No action has been taken by any of the Metropolitan cities under this act.

The towns of Brookline, Framingham and the city of Worcester have constructed incinerators which are currently being operated. The city of Boston has plans and proposals for an incinerator in the South Boston area.

During this period, vesicular exanthema, a disease found in hogs, became widespread in Massachusetts for the first time. While generally non-fatal to hogs and while not a disease of man, it is serious since it cannot be differentiated from hoof-and-mouth disease without exhaustive laboratory analyses.

To control the spread of this livestock disease, the Legislature enacted Chapter 655 of the Acts of 1953, a law requiring hog producers who are feeding garbage to hogs to secure a permit from the Director of the Division of Livestock Disease Control. This law required that after January 1, 1954, all garbage fed to hogs shall be cooked for at least 30 minutes at a temperature of 212°F. From the public health viewpoint, this law is significant in that trichinosis, a disease of man, is under some form of control.

A pamphlet entitled "Refuse Disposal Methods" has been prepared for the guidance of local boards of health and other interested agencies.

*Lockups*

In accordance with the provisions of Section 22 of Chapter 111 of the General Laws, the Department continues to make examinations and to approve plans for jails and lockups.

During this period the Department has approved plans for eight new lockups and renovations for one existing lockup. Upon request the Department has consulted and advised communities relative to conditions in existing lockups. District sanitarians make annual examinations of lockups and jails as delegated by the District Health Officer.

*Nuisances*

The Department has investigated numerous nuisances under the classification of miscellaneous nuisances or under the so-called "noisome-trade laws." In all cases where the request and complaint pertains to local nuisances, the Department has referred the matter to the community for appropriate action under the law.

These complaints vary from the prevalence of leeches in ponds to insect bites suffered by workers in commercial firms. Some others vary from drainage conditions to disposal of night soil by private contractors.

*Cemeteries*

The Department has continued to advise communities on the location and establishment of cemeteries and the extension of existing cemeteries. For this period advice was rendered in the establishment of six new cemeteries and for extension of one old cemetery.

*Local and State In-Service Training*

The Division has been successful during this period in organizing meetings with local and State health officials to discuss mutual sanitation problems affecting both agencies. One such activity was the establishment of one-day State municipal environmental conferences held in different localities throughout the State.

Sanitarians and sanitary engineers from this Division made up part of the staff for these conferences. Some of the subjects covered were: new public health legislation, water supply, sewage disposal, housing rehabilitation, swimming pool sanitation, restaurant sanitation, poultry sanitation and camp sanitation.

The main objectives for these meetings are defined as follows:

(1) To clarify responsibilities of State and local agencies in matters of environmental sanitation;

(2) To discuss new programs and modern accepted practices in the control of environmental hazards.

The Division has continued to cooperate with the New England Field Training Center at the University of Massachusetts by providing speakers for the 12-week course for sanitarians and for one-week courses on specialized subjects. An eight-week course is also presented for graduate sanitarians receiving supervised field training.

During the early period of this report over 89 communities were given ratings of their eating establishments by the Department as a result of surveys conducted by the district sanitarians. In an endeavor to raise these standards the district sanitarians have assisted the local boards of health in organizing schools for food handlers in the technique of proper food sanitation. These training courses are also presented for the food handlers from institutions.

*Insect and Rodent Control*

Many requests for information and advice on problems of control of insect and rodent infestations are handled by the Division. In 1953 the Division cooperated with the Public Health Service in presenting a five-day training course in rat control for representatives of local health departments in Massachusetts.

A member of the Division was assigned for several months in 1950 to a field investigation of methods of control of the eastern dog tick (*Dermacentor variabilis*).

*Home Accident Prevention*

In recent years, as illness and death resulting from communicable disease have been markedly reduced, health departments have taken a new look at the problem of accident prevention.

On August 1, 1953, the Home Accident Prevention Project was established as an integral part of the Division of Sanitary Engineering, financed through a grant of $96,660 from the W. K. Kellogg Foundation. For the first two years the entire cost of the program was borne by the Foundation, but part of the cost is now being financed by the Division. Massachusetts was one of eight states to receive funds for demonstration projects in this field.

The project has undertaken a three-year study of home accidents reported by a selected group of hospitals and physicians throughout the Commonwealth. Preliminary reports of the results of this study have been prepared and it is planned to publish the results of the analysis of about 15,000 injury reports. This report should provide valuable information regarding the types of injury and the environmental hazards associated with these injuries as well as other data that may be useful in planning future home accident prevention activities.

In-service education programs for nurses and sanitarians have been conducted in several areas of the State. The project staff have worked with local boards of health, service clubs, and other agencies interested in developing home accident prevention activities. Lectures and demonstrations have been given to many interested groups, and exhibits have been shown at several meetings of public health groups and at local health department meetings.

A number of pamphlets and leaflets were prepared by the staff and have had wide distribution. News release material has been developed and mailed to selected boards of health, radio stations, and newspapers for local release.

### Atmospheric Pollution Control and Radiological Health Section

This division in past years has been called upon to assist communities in atmospheric pollution problems and, in more recent years, in problems involving possible exposure to ionizing radiation. Increased industrialization and population growth, together with the more and more frequent incidents of inversion phenomena throughout the United States, have made both the public and public health officials increasingly conscious of the need for methods to control air pollutants to insure a continued safe and comfortable environment.

As a result, the demands on this division for the solution of problems involving atmospheric pollution have kept pace with this ever-increasing awareness. During the period covered by this report, legislation was passed whereby the Department of Public Health, under the provisions of Chapter 672 of the Acts of 1954, was vested with the control of all types of air pollutants being discharged to the atmosphere within the Commonwealth. This enabling act now allows for the adoption of rules and regulations designed to specifically control air pollutants, whereas heretofore control was possible only through the broad interpretation of existing nuisance and noisome-trade laws.

In a similar way the demands upon the Department for both information and control of pollution of our land, water, and air by ionizing radiation have increased through public awareness and through the release of government-controlled radioisotopes for peacetime use. Again, during the period covered by this report, enabling legislation has been passed authorizing the Department of Public Health, under the provisions of Chapter 335 of the Acts of 1955, to regulate methods of production, handling, and disposal of radioactive materials which may affect the public health.

As a result of these legislative acts an Atmospheric Pollution Control-Radiological Health Section has been established within the Division of Sanitary Engineering. This section is headed by a sanitary engineer and includes two additional sanitary engineers and a biologist, who have been trained and will receive further training to allow them to effectively and reasonably develop and administer programs to insure the continued highest use of our environment.

To supplement the field work being done two laboratories staffed with trained technicians have been established at the Lawrence Experiment Station, one for radiological health and one for atmospheric pollution control. In addition to routine analyses a major portion of the work is being devoted to fundamental research in the development and standardizations of methods of analysis.

The current activities and duties of this section are as follows:

(1) Oversight of the activities of the Division of Smoke Inspection, which was transferred, under the provisions of Chapter 672 of the Acts of 1954, from the Department of Public Utilities to the Department of Public Health.

The Division of Smoke Inspection is authorized by Chapter 651 of the Acts of 1910 to regulate visible smoke emissions from stationary locomotive and marine stacks within the 31 cities and towns which comprise the Greater Metropolitan Smoke District.

(2) To prescribe and establish minimum rules and regulations to prevent pollution or contamination of the atmosphere within the Commonwealth (Chapter 111, Section 142A).

(3) To advise local boards of health and render technical assistance in all matters of atmospheric pollution (Chapter 111, Section 31C).

(4) To assist in drafting, and reviewing for approval, minimum rules and regulations that may be adopted by local boards of health for the control of atmospheric pollution (Chapter 111, Section 31C).

The Division has drafted a suggested set of rules and regulations for the control of visible smoke, dust, soot and fly ash in the city of Holyoke.

(5) To assume joint jurisdiction to regulate and control such causes of atmospheric pollution adversely affecting one town but arising in another, and may exercise all powers of the local boards of health or other legal authority (Chapter 111, Section 31C).

In conformance with the provisions of this section of the law, an investigation and survey of the Salem-Marblehead area in the vicinity of Naugus Head is being made at the request of the Marblehead and Salem boards of health. Four air-sampling stations have been established and are currently being operated to determine the extent of alleged heavy outfalls in this area.

(6) To conduct special atmospheric pollution surveys in municipalities upon request of the municipality and upon receipt, in advance, of the estimated cost thereof. (Current provisions of Supplementary Budget.)

Such a survey was begun in the town of Milford and will entail source sampling, air sampling and in-plant surveys and investigations. Upon completion of this program suggested rules and regulations for the control of atmospheric pollution in Milford will be submitted to the municipality for consideration and adoption.

(7) Independently, or in cooperation with federal and other State agencies, to conduct special or general atmospheric pollution studies and surveys throughout the State.

In January 1955, at the request of the Pittsfield Public Safety Committee, a special preliminary air pollution survey of the Pittsfield area was made. As a result of this survey it was judged necessary to establish air sampling stations in and about areas adjacent to the industrial complex of Pittsfield to determine levels of heavy particulate outfall, suspended particulate matter and mineral content of the atmosphere in the Pittsfield area.

To evaluate the possible increase in levels of particulate pollution that may result from discharges from the proposed 600-ton-per-day Boston municipal incinerator, the Division is presently selecting sampling sites in areas adjacent to the proposed site. Sampling will begin in the very near future to determine the existing levels before work on the incinerator begins.

Other special sampling surveys now in progress, and to be continued over an extended period of time, to determine background levels of air-borne pollution are as follows:

In October, 1954, in conjunction with the Robert A. Taft Sanitary Engineering Center of the Public Health Service, an air sampling program of the Metropolitan Boston area was initiated. Under this program 24-hour high-volume air samples are taken simultaneously each week from sites in Boston, Everett and Newton. Suspended particulate matter is collected on a glass fiber filter which captures particles down to 0.3 microns in size. The filters are then forwarded to the Sanitary Engineering Center for analyses of the total particulate content, extractible organics, mineral and radioactive analyses.

In October, 1954, a soot and dust fall study was begun in eastern Massachusetts to determine levels of pollution due to the outfall of large particulate matter. Stations were selected for convenience and in areas that will give levels of industrial, commercial and residential air pollution due to heavy particle outfall. These stations, selected to give background data only, are seven in number and are located in the Metropolitan Boston and Lawrence-Andover areas.

In the field of radiological health, the section presently is concerned with:

(1) Prescribing and establishing rules and regulations to control the transportation, storage, packaging, sale, distribution, production and disposal of radioactive materials which may affect the public health or the health of persons exposed to radioactivity or ionizing radiation (Chapter 111, Section 5B).

(2) Maintaining liaison and cooperating with other State departments and other divisions of this Department in matters relating to radiological health.

(3) Maintaining liaison with governmental and non-governmental agencies (such as the Public Health Service and the Atomic Energy Commission) and interstate commissions and groups (such as the New England Interstate Water Pollution Control Commission and the Regional Coordinating Committee on Radiological Health) in matters relating to radiological health.

(4) Conducting special surveys, independently or in cooperation with other State of federal agencies, relative to environmental radiological health matters pertaining to water, air, or persons exposed to radioactivity or ionizing radiation.

The Department is currently making arrangements to participate with the Federal Government and other State agencies in the operation of a National Radiation Surveillance Network. This network is being established to determine levels of radioactive fallout resulting from atomic bomb detonations.

(5) Cooperating with medical, radiological, health physics, educational and engineering professions, industries, and institutions in special problems and in studies relating to sources of ionizing radiation and its relation to the health of the public and to pollution of the atmosphere, water, soil, and the general environment from and by radioactivity and radioactive substances.

(6) Cooperating with and assisting the Civil Defense Agency in certain problems of staffing, training, services, equipment, and facilities in time of certain disasters or programs pertaining to radiological health.

### Division of Smoke Inspection

During the period of this report the Division of Smoke Inspection was transferred from the Department of Public Utilities to the Division of Sanitary Engineering of the Department of Public Health under the provisions of Chapter 672 of the Acts of 1954, effective September 8, 1954. This division is financed by a special assessment on the municipalities within the district, which is known as the Metropolitan Boston Smoke District (Figure 6) and includes a director, supervising smoke abatement inspector, six assistant smoke abatement inspectors and one principal clerk.


FIGURE 6
Metropolitan Smoke District

The Division is authorized by Chapter 651 of the Acts of 1910, as amended, to regulate visible smoke emissions from all stationary, locomotive, and marine stacks within the thirty-one cities and towns that comprise the Metropolitan Boston Smoke District. The district includes the municipalities of Arlington, Belmont, Boston, Braintree, Brookline, Cambridge, Canton, Chelsea, Dedham, Everett, Lynn, Malden, Medford, Melrose, Millis, Milton, Needham, Newton, Peabody, Quincy, Revere, Saugus, Somerville, Stoneham, Wakefield, Waltham, Watertown, Weymouth, Winchester, Winthrop and Woburn, with an approximate population of 2,000,000 covering an area of 320 square miles.

The allowable duration and density of visible smoke emissions as determined by the Ringelmann Chart vary according to the types and diameters of the stacks. In addition, the law provides that the Division may conduct investigations, hold hearings and issue orders for abatement.

From the effective date of transfer to this Department through June 30, 1956 the activities of the Division were as follows:

| | |
|---|---|
| Plant inspections made as result of complaints and violations | 1436 |
| Office conferences held with industrial representatives relative to complaints and violations | 90 |
| Formal hearings conducted under the provisions of Chapter 651 of the Acts of 1910, as amended | 35 |
| Orders to abate issued under the provisions of Chapter 651 of the Acts of 1910, as amended | 14 |
| Excessive emissions and violations of orders to abate | 780 |
| Complaints received relative to stack emissions | 523 |
| Total of stack observations | 254,833 |

## Water Pollution Control

*Examination of Rivers*

The Department has been designated a Water Pollution Control Agency of the Commonwealth and maintains general oversight over all of its surface waters. In this connection the Division of Sanitary Engineering has a Water Pollution Control Section which handles matters pertaining to the quality of surface waters, sewage disposal, industrial waste disposal, shellfish sanitation, and bathing in natural waters. Massachusetts cities and towns were originally established on the seacoast or our principal rivers. Industries were located on streams to take advantage of the abundant supply of soft, clear water, direct water power and also to dispose of liquid wastes. As our public water supplies have generally been taken from upland waters where it has been possible to protect the source, there was originally very little public health significance to our methods of disposal of surface and industrial wastes directly to the streams. As the population and the number of industries has increased, the condition of our streams has deteriorated so that in many instances nuisance conditions have prevailed. In certain instances, notably Lawrence and more recently Billerica, it has been necessary to turn to polluted water courses as sources of domestic water supply. In these instances, adequate water filtration plants have been constructed to provide a safe, potable water.

The Department maintains approximately 260 river sampling stations throughout the Commonwealth. Samples of water are collected periodically for chemical analysis and bacterial examination. At the same time, samples are taken from the effluents of sewage treatment plants discharging into these waters in order to have a more complete record of the cause and effect of these wastes on stream quality. In general it may be said that the small streams of the Commonwealth are not polluted but the main threads of the streams receive sewage and industrial waste either directly or after treatment. Certain of the streams, notably the Nashua River below Fitchburg, the Housatonic River below Dalton, the Hoosic River in North Adams, and the Merrimac River below Haverhill, are occasionally in a nuisance condition. As a result of the construction of industrial waste treatment plants in Mansfield and Foxboro, the Rumford River, formerly very seriously polluted in the town of Mansfield, is now in a suitable sanitary condition. Construction of waste treatment plants serving the paper mills in the city of Fitchburg has improved the quality of the water of the Nashua River to some extent. However, that stream continues to be in an unsatisfactory condition due largely to the discharge of de-inking wastes in the Fitchburg and Leominster areas.

The New England Interstate Water Pollution Control Commission held its first meeting on November 25, 1947. Massachusetts, Rhode Island and Connecticut were signatory to the compact at that time. New York entered the compact on August 19, 1947, Vermont on June 29, 1951, New Hampshire on July 13, 1951 and Maine, the last eligible state, on August 31, 1955. Thus all of the New England states and New York entered into a compact to classify the interstate waters and to work for the alleviation of pollution of these streams. The compact has adopted water quality standards for interstate waters. In general, it may be said that Class A waters are suitable as a source of drinking water without further treatment and for the cultivation of market shellfish. Class B waters are suitable for bathing. Class C waters are suitable for recreational purposes, boating, fishing, industrial water supplies and for the propagation of fish indigenous to the areas. Class D

waters are suitable primarily for the transportation of waste without nuisance and for power and industrial loading. Class E waters are those in which nuisance conditions prevail either regularly or occasionally.

Meetings of the Commission have been held regularly. Subcommittees of the technical advisory board have conducted studies of the quality of waters of various interstate streams leading to the classification of the following streams:

| | |
|---|---|
| Connecticut River | Taunton River |
| French River | Ten Mile River |
| Quinnebaug River | Salmon Brook |

Studies are under way relative to the classification of the following streams:

| | |
|---|---|
| Housatonic River | Beaver Brook |
| Deerfield River | Spicket River |
| Hoosic River | |

*Cooperation with the Public Health Service*

The first federal water pollution control act was Public Law 845 of the 80th Congress, second session. Under the provisions of the Act certain funds were made available to state and interstate agencies for investigation relative to industrial waste disposal, during fiscal years 1949 and 1950. Subsequently, no federal funds were made available for that purpose. As of June 30, 1956, Congress enacted Public Law 660, continuing and strengthening the Federal Water Pollution Control Act. Under the provisions of this law, Congress is authorized to provide grants-in-aid to communities for the construction of sewage treatment facilities and to state and interstate agencies for water pollution control studies. Although the budget was not passed until later in the season, funds for these purposes were made available. Thus, for the first time, cities and towns became eligible to receive grants for the construction of sewage treatment facilities.

The Department cooperated with the United States Public Health Service and other federal agencies in preparing a report of the water resources of the New York and New England area. The report of the joint committee is available and on file in the office of the Division of Sanitary Engineering. The report contains information relative to sources of pollution, the sanitary condition of our streams, and the needs of all communities and industries relative to sewage and industrial waste disposal.

*Prevention of Stream Pollution*

Chapter 615 of the Acts of 1945 amended Section 5 of Chapter 111 of the General Laws, authorizing the Department to promulgate rules and regulations for the sanitary protection of our rivers, lakes, ponds and other watercourses. Such rules and regulations were adopted by the Department on August 14, 1945, and approved by the Governor and Council on September 19, 1945. In general, these rules and regulations provide that no sewage, human excrement, house slops or sink wastes, garbage, manure or putrescible matter, manufacturing refuse, waste product or any polluting liquid poisonous or injurious to humans or animals shall be discharged into any waterway within the Commonwealth except as it may be approved by the Department of Public Health when in its opinion the best practicable and reasonably available means to render the same harmless have been provided in accordance with plans approved by the Department.

These rules and regulations become effective upon publication in any community. The Department has found it necessary to publish or post such rules and regulations in 72 communities.

After some experience, it was found that Section 5 of Chapter 111 as amended did not prove effective in preventing pollution of our waters from municipal sources. In order to correct this situation, the Legislature enacted Chapter 552 of the Acts of 1951, which amended Chapter 111 by adding Sections 1A and 1B. Under the provisions of this act, the stream pollution control law became effective in cases of sources of pollution from municipal or state institutions. However, in cases of municipalities, the Director of the Division of Accounts of the Department of

Corporations and Taxation must hold a hearing in the political subdivision affected, and no political subdivision may be required to expend an amount in excess of that determined by the Division of Accounts to be within its ability to finance for the construction of sewage abatement facilities.

*Municipal Sewage Treatment Plants*

The Division of Sanitary Engineering inspects municipal sewage treatment plants from time to time and collects samples of raw sewage and plant effluent for analysis. Of the 351 cities and towns of the Commonwealth, 136 municipalities are now served by public sewerage systems. The population of such communities as based on the 1955 census is 4,139,350. Sewage from 67 municipalities, representing a total population of 1,716,433 persons, is discharged to sewage treatment works; 215 municipalities have no recognized public sewerage systems. These represent a total population of 698,295 persons. New sewerage systems and sewage treatment plants constructed subsequent to July 1, 1949 are as follows:

NEW SEWAGE TREATMENT WORKS

| City or Town | Year | | Sewage or Effluent Discharged into |
|---|---|---|---|
| Andover(Ballardvale) | 1955 | Imhoff Tank and Trickling Filter | Shawsheen River |
| Attleboro | 1950 | Screens, Grit Chamber, Sedimentation Tanks and Sludge Beds | Ten Mile River |
| Bridgewater | 1950 | Bar Racks, Imhoff Tanks, Trickling Filters, Secondary Sedimentation, Sludge Bed | Town River |
| Dudley | 1951 | Grit chamber, Comminutor, Sedimentation Tanks, Chlorination, Sludge Digestion, Sludge Beds | French River |
| Fall River | 1952 | Screens, Grit Chamber, Sedimentation Tanks, Chlorination, Sludge Digestion, Elutriation Vacuum Filtration and Incineration | Mount Bay Hope |
| Middleborough | 1951 | Comminutor, Sedimentation, High Rate Trickling Filters, Secondary Sedimentation, Sludge Digestion and Sludge Drying Beds | Nemasket River |
| Taunton | 1951 | Grit Chamber, Comminutor, Grease Tanks, Primary Settling Tanks, Chlorination, Sludge Digestion and Sludge Beds | Taunton River |
| Webster | 1952 | Bar Racks, Primary Sedimentation, Sludge Digestion, Sludge Beds and Chlorination | French River |
| South Metropolitan District | 1952 | Coarse Screening, Grit Removal, Comminution and Fine Screening, Aeration, Sedimentation, Chlorination, Sludge Digestion | Boston Harbor |

*Improvements or Additions to Sewage Treatment Works*

| City or Town | Year | | Sewage or Effluent Discharged Into |
|---|---|---|---|
| Ayer | 1952 | New Settling Tanks and Sludge Beds | |
| Concord | 1955 | New Imhoff Tank | |
| Gardner | 1952 | Reconstructing Sludge Beds | |
| Marion | | Rehabilitation of Plant and New Chlorination | |
| Saugus | 1952 | New Comminutor at Pumping Station | |
| Spencer | 1950 | Additional Settling Tanks and Sludge Beds, Renovation of Sand Filters | Seven Mile River |

*Shellfish*

The Division of Sanitary Engineering, in determining the suitability of shellfish areas for the taking of shellfish, examines roughly 2000 miles of Massachusetts coast line, which encompasses some 50 cities and towns. In 1950, Massachusetts occupied second place among the nation's leading soft shell clam producers. It has been estimated that some 20,000 acres of flats in the State at one time were producing shellfish. In Boston Harbor alone some 2,000 acres have been reduced to about 15 per cent of their former productivity. Various studies have failed to reveal the actual causes for the depletion of shellfish in areas formerly highly productive, but suspicion has been cast on the deleterious effects of sewage pollution on the flats and the decimating effect of natural predators on the shellfish population as possible contributing factors. At the present time the number of closed shellfish

areas, located in some 30 communities and ranging from entire harbor areas to small portions of coast line and estuaries, totals approximately 35. The number of areas from which shellfish may be taken for purification purposes only, designated as moderately polluted areas, totals approximately 40.

Under Massachusetts law the Division regulates the following aspects of the Massachusetts shellfish program:

(1) The classification and the approval of harvesting areas from which shellfish may be taken for food purposes.

(2) Approval of the construction, operation and maintenance of shellfish purification plants.

(3) Approval of out-of-state shellfish certificates.

In approving shellfish harvesting areas, the Division performs various and numerous examinations dealing with the sanitary quality of the shellfish and overlying waters. Sanitary surveys are conducted of the watersheds tributary to the shellfish growing areas to establish to what extent the growing areas are subject to pollution. Representative samples of the shellfish and overlying sea water under varying conditions of tide and wind are collected and analyzed for bacterial content at the Lawrence Experiment Station.

The number of bacterial examinations of shellfish samples made at the Lawrence Experiment Station is as follows:

| *Fiscal Year* | *Shellfish Samples Examined* |
|---|---|
| 1949–1950 | 913 |
| 1950–1951 | 1,183 |
| 1951–1952 | 1,285 |
| 1952–1953 | 1,227 |
| 1953–1954 | 3,335 |
| 1954–1955 | 1,217 |
| 1955–1956 | 1,654 |

The construction, operation and maintenance of shellfish purification plants are subject to the approval of the Department of Public Health under Chapter 130 of the General Laws, as amended by Chapter 598 of the Acts of 1941, and the rules and regulations adopted by the Department of Public Health on May 10, 1949. Research has been conducted relative to the purification of shellfish, which has led to the establishment of the method presently employed at the Newburyport Shellfish Treatment Plant. Weekly inspections of the plant are made in order to appraise operating conditions.

The numbers of barrels of clams treated at the Newburyport Plant during the years 1949–1956 are as follows:

| *Fiscal Year* | *No. of Barrels* |
|---|---|
| 1949–1950 | 22,704 |
| 1950–1951 | 31,002 |
| 1951–1952 | 28,090 |
| 1952–1953 | 19,300 |
| 1953–1954 | 14,176 |
| 1954–1955 | 22,104 |
| 1955–1956 | 17,002 |
| Yearly Average | 22,054 |

The average number of barrels treated during the years from 1941–1949 was 15,597. Therefore, 1949–1956 showed an increase of 41.4 per cent over the previous years. In order to handle the increased load at the Newburyport Plant, a new addition was constructed in 1952 containing six reinforced concrete tanks. The

tanks are divided by two baffles so that continuous aeration and recirculation of water may be practiced if desired. As yet, no washing mechanism or conveyor belt to facilitate culling of broken clams has been installed, although it was planned to have this upon the completion of the new building. It is hoped to install this equipment in the near future.

New legislation passed in recent years concerning the sanitary control of shellfish areas has assisted the Division considerably in regulating its shellfish sanitation program. Section 74 of Chapter 130 of the General Laws, as amended by Chapter 243 of the Acts of 1954, directs that the Department no longer need examine all contaminated shellfish areas yearly but shall examine them for contamination from time to time as conditions may require, but not necessarily more frequently than once in two years. Prior to the passage of this legislation, the Department was performing the arduous task of conducting examinations annually of all contaminated shellfish areas. These examinations, annual advertising and posting have been a drain on both the finances and personnel of the Department.

Section 74 of Chapter 130 of the General Laws, as amended by Chapter 288 of the Acts of 1956, which authorizes the Department immediately to designate shellfish areas as contaminated in the event of emergencies, assists the Department substantially in guarding the public health against possible infection from waterborne diseases transmitted by contaminated shellfish.

Section 81 of Chapter 130 of the General Laws, as amended by Chapter 711 of the Acts of 1955, provides that no action is necessary on the part of the Department of Public Health in the matter of importing shellfish into Massachusetts from a foreign country or province, provided that such foreign country or province has approved certification from the United States Public Health Service.

## Lawrence Experiment Station

The period from 1949 to 1956 was marked by the closing of the Water and Sewage Laboratory, which had been operated on the top floor of the State House since January, 1897, and of the old Experiment Station in Lawrence, which had been the site of the research work as well as much of the analytical work of the Division of Sanitary Engineering since 1886. October, 1952 saw the laying of the cornerstone of the new station, and in March, 1954 all the laboratory and research facilities of the Division, with the exception of the district laboratory in Amherst, were consolidated in the new Lawrence Experiment Station.

The new building with its ample modern facilities and the long-needed working space houses not only the analytical laboratories and the research on water, sewage, and industrial wastes, but also the radiological studies, which first began at the old station in 1951; the plumbing laboratory, which first functioned in 1955; and the laboratory work on air pollution, which also first began in 1955 and reached full-scale operation in 1956.

Although much new laboratory apparatus was purchased for the new station, a considerable amount of equipment was salvaged from the old laboratories, and the moving and arrangement of both old and new facilities was a formidable task. Careful scheduling made it possible to keep complete equipment in operation at one site or another, so that the necessary analytical work of the Division was continued without interruption and the normal schedule of samples from the cities and towns of the Commonwealth was always maintained. The longest interruption in examination of the water samples current in the bacteriological laboratory was spent in the transportation of cultures from the old station to the ample and carefully controlled incubator room in the new building.

The following table summarizes the samples examined by the combined laboratories during the period 1949–1956:

| | |
|---|---|
| Chemical samples in connection with the investigation of the disposal of domestic sewage, treatment of water, and inspection of rivers and bathing places . . . | 56,645 |

| | | |
|---|---|---|
| Chemical samples in connection with the investigation of industrial wastes | 16,778 | |
| Chemical and mechanical analyses of sand and other filtering materials | 2,193 | |
| Total chemical | | 75,616 |
| Bacterial samples in connection with water supplies, bathing places, stream pollution and other work of the Department | 116,970 | |
| Bacterial samples in connection with shellfish | 12,170 | |
| Total bacterial | | 129,140 |
| Microscopic examinations | | 7,716 |
| Radiological examinations | | 3,704 |
| Grand total | | 216,176 |

In addition there were about 1,000 air samples up to the end of June, 1956. At present the rate of such samples approaches 1,000 per month.

In addition to the regular professional staff of this station, from one to five sanitary engineers have been assigned to work out of Lawrence supplementing the work of the district engineers, and particularly caring for most of the field work on stream pollution, industrial wastes and special problems involving water supply and sewage disposal. In many cases on special assignments members of the regular personnel of the Station are assigned to work in the field with these engineers or with other engineers assigned from the main office or from the district headquarters.

In connection with public water supplies, the Division maintains a constant check on every water supply in the State. In carrying out this work three chemical samples from every water supply are examined each year; and from other cities and towns, particularly those considered as critical areas from a standpoint of civil defense, samples are taken more frequently. In all, this accounts for about 2,500 chemical samples each year. In addition, during the past seven years special problems of one kind or another involving 62 water supplies have resulted in special samples at the Station, and many times these investigations required special experimental work. Such samples totaled nearly 3,000 during the seven-year period. The great majority of these samples were collected by members of the engineering staff, but in very many cases again Lawrence personnel assisted in the collection of samples and particularly in field analysis and other special work. One of the causes of these special samples was the growing interest in the correction of corrosion. As more and more supplies utilize the addition of alkalies, or of special chemicals like sodium hexametaphosphate, the problems for all of these water supplies become more important and involved. In almost every case this station is required to determine by means of the Langelier test the optimum concentration of chemicals which should be added and, after treatment has begun or is being maintained, it is very frequently necessary to examine large numbers of samples from the distribution system in order that the best effects may be obtained from such treatment.

Other special work results from natural causes, including, of course, the hurricanes which were experienced several times during this period. During these natural disasters it is generally necessary to send out personnel from the Station to supplement the field work of the engineers, and especially to assist them in the installation of emergency chlorinators or other equipment, all of which is normally stored at the Experiment Station. On two occasions during this period fire destroyed chlorination equipment, and emergency apparatus at the Station was installed in a very short time. Frequently also water shortages compel cities and towns to use auxiliary supplies or to make temporary connections to other supplies, and in each such case extra samples are analyzed and personnel are sent out to do such work.

In addition to the usual sanitary analyses on water supplies, there is a frequent demand for special determinations, such as those involving the use of water for boiler purposes, the possibilities of corrosion, and the usefulness of the water in

certain industries. In order to keep such information current a program has been set up under which a very complete mineral analysis is made on every water supply about once every two and a half years, with more frequent examination of some of the supplies from which numerous industries make demands.

Almost continuously the Station is requested to give assistance in regard to tastes and odors in water supplies. Sometimes these are associated with corrosion or other problems discussed above, but frequently they are the results of the presence of algae or other organisms. The Station makes regular and frequent microscopical examinations of most of the water supplies in the State, and in addition makes special determinations if taste and odor problems arise, with a view to indicating the proper kind and degree of treatment and the success obtained by such treatment. In addition, about a dozen municipalities have made intensive investigations to improve the tastes and odors in their supplies, and in several cases this has involved hundreds of samples being received and examined at the Station.

One of the most important of the newer parts of the work of the Station has resulted from the growing use of fluorine to reduce dental caries. Every water supply in the State has been examined several times to determine its normal fluoride content, but whenever a supply receives additional fluorides the Department requires that examinations must be made daily by the water department, and in addition analyses are made several times a month by the Experiment Station. In this way a check is maintained on the local determinations. The method now in use is one which was devised by the personnel of the Station, to be as simple as possible while still giving accurate results in the hands of normal water plant personnel. In order to make sure of uniform procedure all of the equipment and all of the chemicals used by the water departments are furnished from the Experiment Station and these are renewed very frequently. In addition, the Station, upon request, examines supplies of fluoride and tests equipment and apparatus used in the fluoride treatment. In addition, to check determinations of the simpler method, every supply is examined by more delicate means quite frequently. Almost since the beginning of the use of fluoride the Station has maintained almost constant research on improvement of methods for very exact laboratory work and for the field. As part of the training program always being carried on at the Station, representatives of practically all of the water departments now using fluoride have received more or less special training at the Experiment Station.

In addition to the chemical samples received from the water supplies, the Station sends out and receives every four weeks from one to ten bacteriological samples on every supply in the State. A few samples from nearby supplies are brought in to the Station, but the great majority are received by mail or express. The average number of samples thus received is almost 7,000 each year. Practically all of the water supplies of the State are free from coliform bacteria, but in case such organisms are found the engineering forces are promptly notified so that remedial measures may be taken and repeat samples be examined. In addition, of course, in cases of emergency many more than the normal number of samples are received.

Particular assistance has been given in regard to cities and towns using various methods of filtration in procuring their water supply. Many of the personnel engaged in coagulation and filtration work have received training at the Station. However, the constant use of new chemicals and unusual weather conditions many times make it necessary to give special assistance, either by analysis or field work, for the best solution of these problems. As an example, over a dozen of these water supplies from time to time have used special filter aids and in each case the assistance of the Station was required. In addition, the Department continues to make analyses of sands and other filtering material for water filtration as well as for sewage work.

A very considerable amount of work results also from the use of weed killers in water supplies or in their tributaries and in areas surrounding watersheds. In almost every case these materials result in taste and odor problems.

In addition to the work on public water supplies, each year several hundred

samples for chemical and bacteriological examination are received from semi-public supplies, such as camps, schools, and bathing and other recreational areas. The law in regard to most of these areas requires an approved water supply, and analyses of samples from such sources are made at the Experiment Station.

As mentioned above, a great part of the work of the Division on pollution of streams was conducted from the Experiment Station, and for the past several years practically every important river basin in this State has been examined monthly or more often. In addition to the usual sanitary chemical and bacterial samples involved, in many cases special determinations have been made, particularly in connection with the discharge of sewage or industrial wastes into the streams. In this connection this Station has assisted the Department in its cooperation with the work of the New England Interstate Water Pollution Control Commission, and representatives of the Station have assisted on the technical committees of this organization.

*Chemical Research*

Many of the special problems on both drinking water and polluted streams require more or less detailed research in the Chemical and Research Laboratories of the Station. All analytical work is done in accord with Standard Methods, but in preparation of samples, and especially when dealing with pollutants or metals in very low concentration in waters high in organic matter or otherwise grossly polluted, adaptations are often necessary. Practically all the methods for metals include the use of electronic determinations. Among the important tests for which special means have been developed are the following:— cadmium, chromium, copper, for which there are three methods, iron (in many forms), lithium, phosphorus, potassium and sodium. Two special methods for the very difficult determination of sulfates in small concentrations have also been developed. In addition, methods have been adapted for the determination of the many different kinds of detergents which are now encountered in the work on streams. A special method of determination was evolved for the presence of phenols and similar compounds, which may cause undesirable tastes and odors in concentrations of only a few parts per billion. Other special analyses evolved or adapted include those for DDT, several herbicides, and oils, pigments and carriers resulting from the discharge of paint and oils into the water.

In connection with the representation of the Station on the Standard Methods Committee in the Federation of Sewage and Industrial Wastes Associations, a large amount of research work has been done in regard to the more accurate determination of chlorine and chlorine compounds and of chlorine dioxide and other oxidizing agents in very small concentrations in water. This work also involves the study of tastes and odors associated with oxidizing materials. Similar work has resulted from the use of chlorine-bearing starches and other organic materials.

Another special series of determinations was made in regard to more accurate methods for the determination of fats, oils and grease in sewage sludges. As a result of this work it was concluded that for most purposes the method in use at the Experiment Station since 1890, which consists of evaporation barely to dryness, followed by extraction with hexane or occasionally some other solvent, gave results at least as good as proposed methods of extraction, followed or preceded by freezing, centrifuging and similar assistance.

The use of the polarograph in many determinations, but particularly in regard to the determination of dissolved oxygen, especially in connection with determinations of B.O.D., has resulted in the preparation of methods which are very valuable in certain cases where extremely accurate work is required.

Other work involves the study of the effect of acetic acid and other similar organic acids on the determination of B.O.D. It is believed also that determinations of B.O.D. as presently made are essentially much more accurate and much more representative because of the intensive study on adequate methods of seeding.

*Bacterial Research*

During the past seven years the Bacteriological Laboratory has examined a total of almost 130,000 samples. Many of these were in connection with the sanitary control of water supplies and of other waters in the State and in connection with stream pollution work. In addition a very large amount of work has been conducted in connection with the research in regard to the purification of sewage and biological treatment of industrial wastes or sewage containing such wastes. Since, as will be discussed more fully later, a very large part of the wastes upon which investigations are made are of a somewhat toxic or inhibitory nature, it is often found difficult to bring about the formation of adequate flora for biological treatment. More and more, therefore, it has been found valuable and useful to enlist the assistance of the Bacteriological Laboratory in all stages of treatment of industrial wastes.

In addition, it is constantly necessary to continue examination of the methods in use in determining bacterial content of waters. Since the Station is represented on the committee responsible for bacteriological procedures under Standard Methods, all of the determinations made at the Bacteriological Laboratory follow these standard procedures. However, there are many methods other than those considered standard which are presented for evaluation. Several times previously it has been found that, in general, media and methods intended to assist bacteriological personnel in differentiating the various members of the indicator coliform group and of other organisms commonly found in water and sewage tend to retard or prevent the growth of the characteristic organisms which are being sought. In this respect the Station in cooperation with other laboratories has conducted a series of tests involving many thousands of cultures. As a result of this work the Station and the bacteriological laboratories of many other very important states are convinced that for the present our methods called "Confirmed" and "Completed" are sufficiently accurate and represent, when properly carried out, adequate pictures of the sanitary quality of the water under examination with regard to the present standard for the presence of coliform organisms, which is one such organism per 100 ml. of the water examined.

It is felt strongly that any attempt to use only certain members of the coliform group or to depart in any material way from the present standard would result either in the acceptance of waters somewhat below the present standard of purity or undue efforts on the part of certain water supplies to reach an unnecessarily high standard. At the same time the Station has continued to urge water department personnel who can do so to produce water containing bacteria far below the present standard.

On many water supplies, oftentimes in connection with work involving tastes, odors and colors, the Bacteriological Laboratory has made examination of slimes found in the distribution systems, and especially in dead ends or in parts of the systems with relatively little flow. Differentiations of organisms found in some of these sites have shown that in many cases these organisms must be regarded as degraded members of the coliform group. It has also been found that these organisms tend to resist dosages of chlorine which are almost completely fatal to normal coliform organisms. It is felt that these resistant organisms in general cannot be considered as true indicators of bacterial quality, but that they must be regarded as undesirable since they may indicate improper design or inadequate treatment.

For a great many years lactose broth has been the only standard medium for determining the presumptive presence of coliform organisms in drinking water. For a great many years the Station has conducted investigations into other preliminary media and a special value has been attached to a Lauryl tryptose broth, which is particularly valuable because of the presence of surface tension reduction agents and the products of digestion of meat which are particularly valuable in rapid growth of coliform organisms and tend to reduce the growth of non-coliform organisms to a somewhat greater degree than does standard lactose broth. Under the leadership of the Experiment Station, a detailed comparison for these two media

was conducted. The results were presented at a meeting of the APHA, and as a result of this work Standard Methods now permit the use of the LT media in primary water examination.

Another intensive investigation was in regard to dehydrated media. It was found that practically all of the dehydrated products now available in the market are very high in quality. It was also found that many small laboratories tend to purchase dehydrated media in large-sized packages for the sake of economy, and since such packages may not be used for a period sometimes in excess of a year, serious deterioration was experienced, with disastrous effects on bacteriological determinations. In this same connection it was found that media prepared from these dehydrated products and stored for several weeks or months tended to show undesirable changes which interfered with the best determinations. As a result of this work by the Experiment Station and by other laboratories, Standard Methods require the use of dehydrated media in all but the very large laboratories. In Massachusetts all laboratories approved for examination of water must purchase dehydrated media in sufficiently small quantities to avoid the difficulties due to excessive storage.

As stated above, a very great majority of samples from public water supplies are sent to the Experiment Station by mail or by express and are necessarily in transit for periods up to, but generally not exceeding, 24 hours. This is also true of the laboratories of the United States Public Health Service and of most of the larger states, and for many years personnel in charge of these laboratories have been concerned over the possibility of changes during such periods of storage or transit which might interfere with the laboratory's returning the proper picture of the waters under investigation. For several years, under the auspices of the Standard Methods Committee for the Examination of Water, investigations have been under way and the Experiment Station has conducted several such surveys. In 1955, a paper was prepared by the Experiment Station analyzing the results of samples collected and examined over the period of a year by the New York and Massachusetts Departments which had been stored both at room temperature and at refrigerated temperature for 24 hours.

The conclusions reached after this examination of several thousand such samples were that under normal circumstances, and except possibly in extremely hot or extremely cold weather, samples of normal surface water supplies which were received at a laboratory within 24 hours after collection could be accepted as presenting a proper picture of the sanitary quality of the water at the time of collection. There still remains the problem of samples remaining under excessive temperatures and for periods longer than 24 hours, and at the present time efforts are being made for a federal grant to permit an intensive study of samples at the Experiment Station.

## COMPARISON OF THE MEDIAN RATIOS OF STORED MPN TO INITIAL MPN

TABLE I — *Massachusetts Water*

| | No. of Samples | 24-hr. Room Storage MPN to Initial MPN | | 24-hr. Refrigerator Storage MPN to Initial MPN | |
|---|---|---|---|---|---|
| | | Median Ratio | 95% Confidence Limits | Median Ratio | 95% Confidence Limits |
| Year | 190 | .915 | .77–1.00 | .86 | .76– .97 |
| Summer (May–October) | 100 | .74 | .63– .92 | .88 | .77–1.10 |
| Winter (November–April) | 90 | 1.12 | .85–1.20 | .825 | .73– .93 |
| MPN — 23 or less | 59 | 1.07 | .90–1.8 | .89 | .63–1.3 |
| 24–79 | 53 | 1.02 | .75–1.39 | .92 | .78–1.21 |
| 80–230 | 52 | .71 | .53– .92 | .755 | .46– .97 |
| over 230 | 26 | .61 | .31–1.1 | .77 | .50–1.0 |

TABLE II — *New York Water*

| | | | | | |
|---|---|---|---|---|---|
| Year | 69 | .66 | .51– .96 | .74 | .60–1.00 |
| Summer (May–October) | 32 | .67 | .39–1.28 | .78 | .52–1.23 |
| Winter (November–April) | 37 | .66 | .50– .96 | .67 | .48–1.00 |
| MPN — 23 or less | 27 | 1.02 | .65–1.49 | 1.00 | .67–1.77 |
| 23–230 | 23 | .51 | .29– .97 | .67 | .42–1.22 |
| over 230 | 19 | .51 | .39– .74 | .52 | .45–1.09 |

Another field in which the Experiment Station has conducted a very significant research is in regard to the membrane filter which has been under study to a considerable extent ever since it was in use in Germany during the late World War. Methods of manufacture have now made it possible to produce uniform membranes of any desired porosity and the mechanical equipment for using the membranes has been highly developed. However, although many attempts have been made to produce a standard medium for determining the presence of coliform bacteria with these membranes, there still remains a very considerable degree of question as to the results obtained. For the past four years the Experiment Station has conducted more intensive work with the MF in an effort to overcome some of the difficulties.

In 1955, a compilation was made and presented to the APHA entitled "Comparative Densities by the Membrane Filter Test and by the Multi-tube Technique of Standard Methods." This paper presented the results of a study of several thousand samples and showed the inaccuracies or inconsistency also affected by time of incubation, type of water, and methods of counting and other examination, all in addition to difficulties encountered from apparently inadequate medium. It was particularly pointed out that best results were obtained when coliform contamination was relatively fresh and unmixed with other organisms but that results as compared with the Standard Methods became progressively worse with time of storage of waters or the influx of relatively large numbers of soil or other organisms (Figure 7). It was also shown that under optimum conditions it was possible to obtain results from the membrane filter method practically identical with those from the Standard technique, but that the two methods would not necessarily determine the same types of organisms. It was also indicated that none of the media available were entirely satisfactory. This work like that of other investigations shows that if the membrane filter should be substituted for the Standard technique a new standard of bacterial purity would have to be used and that at present our information is not sufficient to set such a standard. Work on the membrane filter has continued during the year following the presentation of this paper and it is obvious that improvements as a result of our work and that of other investigators are being made, but there still remains a very considerable amount of investigation. Requests for a grant to continue this work are also being made.

For the past seven years, in connection with the approval of other laboratories by the Department, approval has been given several laboratories for the determination of coliform bacteria in water supplies. The examination and approval of such laboratories has been a function of the Experiment Station and at the present time there are over 40 laboratories approved. It is felt that, as a result of standards for equipment, personnel and such details as the required use of dehydrated media, the work of the smaller laboratories has definitely improved during the past few years. It is believed to be particularly useful that these approved laboratories have been urged to record and report their work in a form as close as possible to that used in the Experiment Station so that the work of these laboratories on public or private water supplies may be readily compared with that of the Station.

*Shellfish Research*

During the past seven-year period the Station has continued to exercise supervision over the Newburyport Shellfish Treatment Plant by means of frequent visits and inspections, and check chemical and bacterial examinations. Further studies on the methods of cleaning have been carried on, in conjunction with the engineers of the Division, and a procedure which promises much improved efficiency is ready for use whenever the proper treatment facilities are provided.

The Station has continued to receive and analyze samples of water and shellfish from all of the areas of the State.

Research into methods of analysis has been practically continuous. The nationwide approved method of sample preparation calls for maceration of the shellfish meats. The type of emulsion thus prepared varies widely with the species, the size, and the freshness of the shellfish, with probable additional variation from one

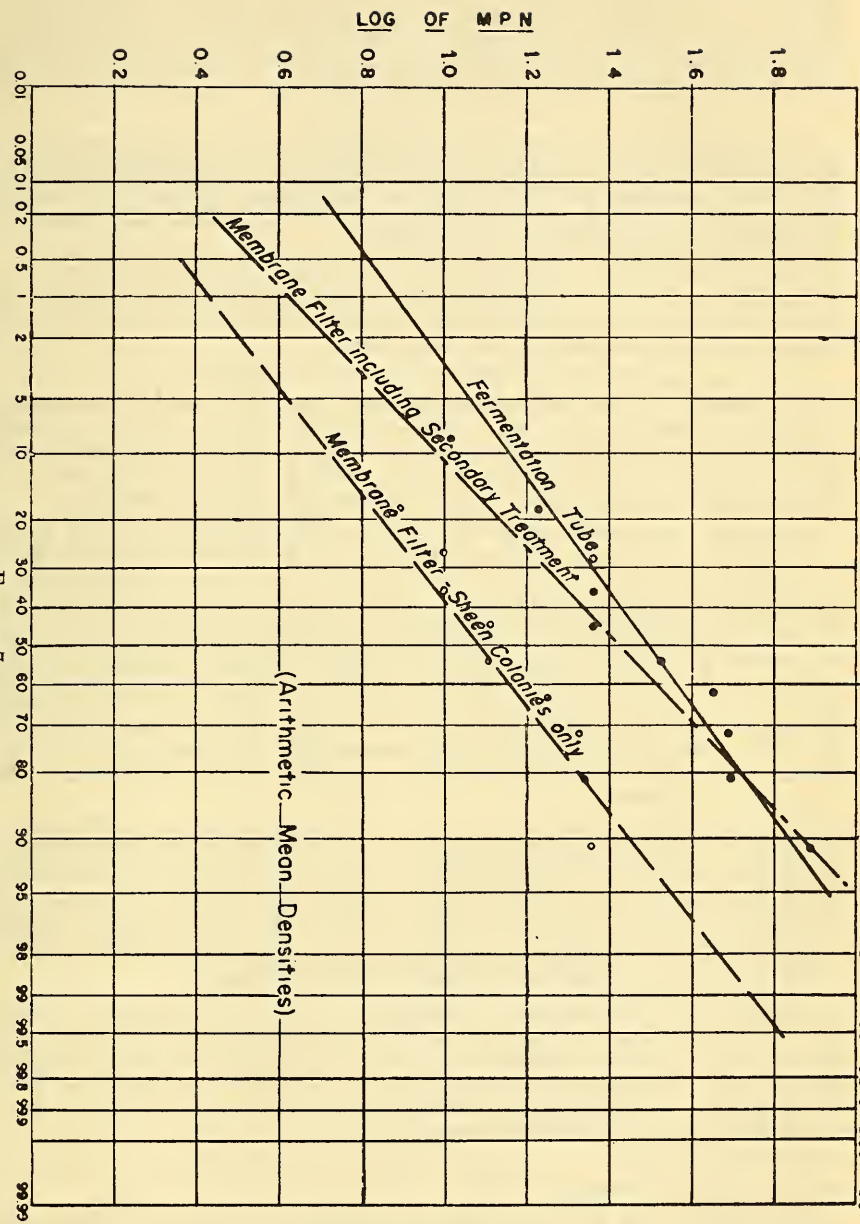


FIGURE 7
Tube MPN vs. Membrane Filter MPN

season of the year to another; in addition macerators apparently quite identical may produce different sample preparations. For the determination of the coliform group, which is the most common indicator of pollution, present Standard Methods permit the use of lactose broth or lauryl tryptose broth. When portions of samples prepared in accordance with Standard Methods are inoculated into either medium the relatively high content of muscle sugar in soft clams and quahogs, the shellfish most commonly received in our laboratory, as compared to oysters, which are more common in most other parts of the country, tends to upset the intended concentration of the medium and to produce false results.

These conditions have been carefully reported to the APHA Committee on Standard Methods for the Examination of Shellfish, on which the Station is represented, and it is hoped that the forthcoming edition of Standard Methods will permit sufficient tolerance in procedure to give optimum results in the examination of shellfish most important to New England.

The relative significance of E. coli and of the whole coliform group also appears to be different in our soft clams than in oysters, especially those grown in the warmer southern beds. For this reason the Station has consistently opposed the use of E. coli alone as an indicator of pollution.

Partly because of confusion regarding coliform significance, the use of coccal forms, especially of fecal streptococci, has been suggested to replace or supplement coliforms as indicator organisms. Although methods available for the determination of fecal streptococci have greatly improved as a result of studies in which the Station has participated, it still is not the opinion of the Station that the use of these organisms for anything but supplementary information is justified.

For many years the problems of serious deterioration, and especially greatly increased coliform content in clams and particularly in mussels shipped from Maine to Massachusetts or New York, or from Massachusetts to New York, have troubled the various agencies involved. As a result of conferences of New York and New England States, held at the Experiment Station, cooperative shipping and analytical experiments were conducted, as a result of which it appeared possible to state that soft clams could be shipped anywhere and anytime within the New England States and to New York with adequate care in regard to handling at the source, containers, refrigeration and ventilation without significant effect on quality and particularly the coliform content; but that during the summer months it was not probable that mussels shipped to New York would be acceptable unless prohibitively costly methods were employed.

The Station was invited to participate in a national conference in Washington, sponsored by several Federal agencies, on mussel poisoning, which had become prevalent in Alaska and on the West Coast. A long series of analyses by the Station in 1943 had shown that the disease was not present along the New England coast, and this is still true. However, the Station will be expected to resume its testing program if the poisoning should appear along the Atlantic, and we have information and most of the apparatus necessary for such testing.

Other shellfish work included participation in studies of the sanitation of lobster and crabmeat opening and packing, including experiments at the Station. The Station also developed a satisfactory method for dyeing soft clams presumably dug for bait to prevent their being sold for food. A series of experiments indicated that aureomycin could not be satisfactorily used to reduce the bacterial content of soft clams or to maintain their freshness.

*Sewage Treatment Research*

In connection with sewage disposal the standard procedure up to 1955 was to examine a series of samples from each treatment plant in the State several times each year. In the past two years, this practice has been supplemented or replaced by a one or two day inspection by one or more engineers, generally those stationed at Lawrence, which includes the collection of samples over a period of at least 24 hours. This work has been integrated with the stream pollution program of the

Division. In many cases the samples from the sewage treatment plants, and in some cases of sewage discharged without treatment, can be correlated with those from receiving streams. In the past few years this work has been supplemented by determinations of the rates of deaeration and aeration of the streams. In many cases there have been simultaneous examinations of industrial wastes, and this has required many times special determinations of metals, of paints, of oils and greases, of detergents, and of other materials which make the sewage of today a very complex mixture. It was often necessary to devise new methods, or to adapt old ones to make these determinations.

As usual, the Station has made many analyses of sand and stone and other filter materials intended for use in new or enlarged municipal treatment plants. Special analyses usually for the determination of nitrogen and organic matter have been made from practically every treatment plant using slow sand filters, including many State institutions, to assist the engineers in regard to cleaning, or additions or replacements, but a much greater number of analyses, particularly of sand and soil, has been in connection with sewage disposal in rural areas and other regions of the State which are, because of the rapid growth of many cities and towns, not served by municipal sewers. In addition to the usual analyses on these samples, it was often necessary to set up percolation experiments.

At the old Station a group of septic tanks and several subsurface disposal areas had been in operation for many years. From these experiments there have been gathered much valuable data in regard to tank dimensions, detention time, significant methods of analysis, sludge accumulation, and especially the degree of treatment by septic tank most suited for disposal in a given soil. It was shown for instance that in relatively very fine soil, the inorganic suspended solid content of the effluent has a very important effect on the adequacy and permanence of a receiving field.

The Station also for many years had the opportunity of measuring and observing the operation of several large disposal fields nearby. As a result of all of these studies, the Station was able to make significant contributions to the bulletin on rural sewage disposal prepared by the Division.

In the last year of the old Station the study of trickling filters, which had gone on without interruption since 1890, was continued until the end of 1953. During most of those years a group of a dozen filters was operated with relatively heavy liquid rates and high B.O.D. loadings; most of the filters were operated in sets to show effect of such factors as depth and type of stone, sedimentation, and recirculation, as well as secondary or two-stage treatment. Several conclusions have been reported from year to year from this work. Single-pass trickling filters receiving enormous loadings up to 20,000 pounds per acre-foot per day still showed a degree of purification; although the removal of B.O.D. and of suspended solids might be as low as 20% of the loadings applied, nevertheless the filter did effect a real change in the sewage applied. Filters on which the effluent was recirculated one or more times gave materially greater reductions in B.O.D. than similar filters receiving the same load but with no recirculation. This improvement was relatively slight with raw B.O.D. loadings of 1,000 pounds or less per acre-foot, but the relative efficiency increased rapidly with loadings increasing from 1,500 to 7,000 pounds. Increasing the number of passages through the filter from one time to three or four materially improves the efficiency of the filter; further increases give very little if any added improvement. Both single-pass and recirculated filters showed fairly sharp decreases in percentage B.O.D. removal up to about 7,000 pounds loading, and with loads further increased the efficiency expressed in per cent dropped very slowly. In Figure 8 the average per cent of B.O.D. removal and the average pounds removed per acre-foot per day is plotted against all the loading for both single-pass and recirculated filters operated from 1941 to 1955. The curves of percentage of removal are similar in that they show a deflection at about 7,000 pounds loading. The improvement in efficiency effected by recirculation is plainly shown. The curves for removal in pounds per acre-foot are quite different; that for the recirculated filters is practically a straight line up to a loading of 12,000

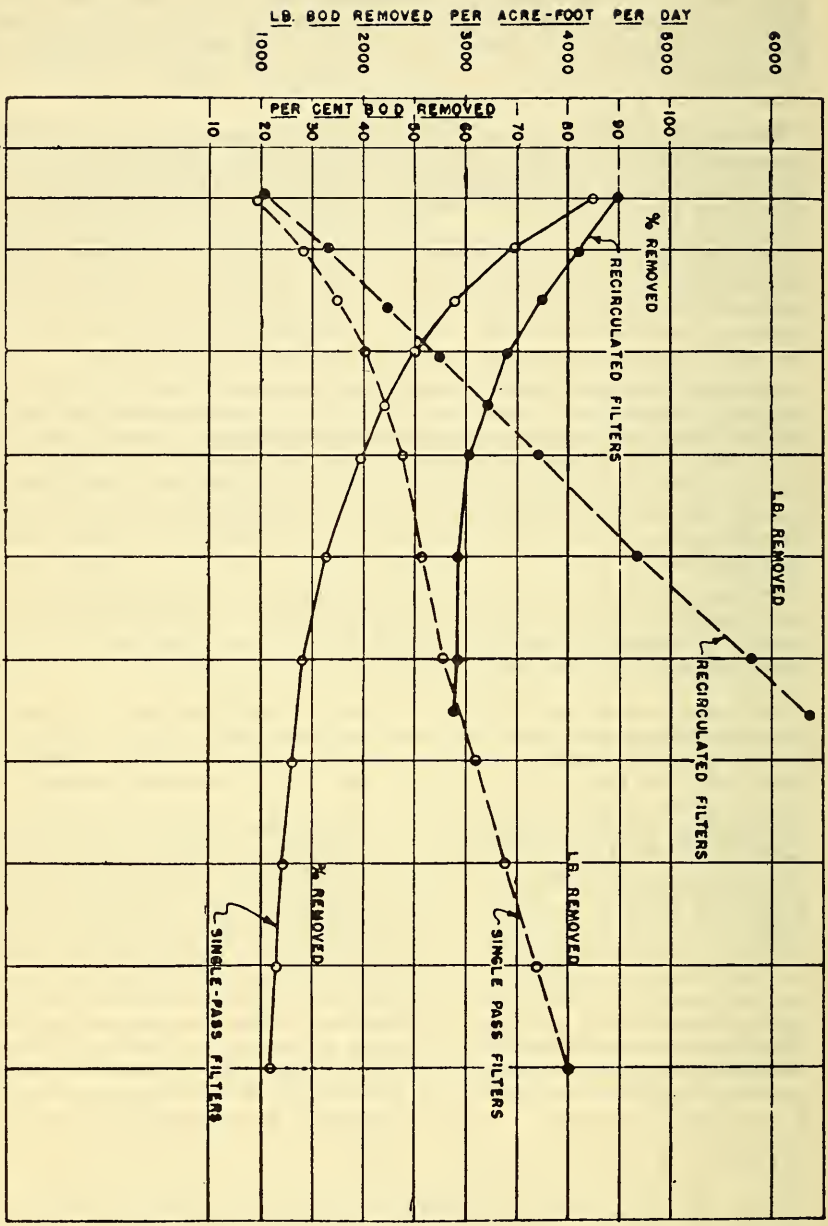


FIGURE 8
Performance of Trickling Filters: Removal of B.O.D., 1949–1955

pounds, but the curve for the single-pass filters shows a fairly sharp deflection at about 4,000 pounds loading, and from this point the ratio of removal to the applied is much less.

For any given B.O.D. loading from 1,000 to 10,000 pounds per acre-foot per day a filter with or without recirculation with six feet of stone gives much greater B.O.D. efficiency than filters with only three feet or four feet, and the differentiation increases in proportion to increasing load. Removal of suspended solids is also better, but the difference in loadings up to about 2,000 pounds is very small.

The efficiency in pounds removed per acre-foot of systems, including two trickling filters in series, was generally less than that of a single filter with the same net loading, but if the order of receiving the sewage was alternated once a week, the overall efficiency of the combined system was much increased.

The period of detention in intermediate settling tanks in recirculating filters had an important effect on the normal efficiency. Longer detention gave improved settling but decrease in dissolved oxygen, with the net result that within reasonable limits efficiency was improved by reducing the detention time as the load increased. Aeration of intermediate tanks was not successful except with very heavy loadings. It is interesting to note that in later experiments with highly organic waste a very definite improvement in trickling filter efficiency was effected by intermediate aeration.

Secondary filtration of settled trickling filter effluents on four-foot beds of sands showed that highly satisfactory effluents could be obtained with continuous loadings up to 250 pounds of B.O.D. per acre, as against a normally accepted loading of 100 pounds; and that for short periods loadings could be increased to 350 pounds per acre without serious injury for the filter or undue deterioration of the effluent.

In the new Station a continuous uniform supply of settled domestic sewage is available throughout the research area. The system of sumps, pumps, tanks and distribution pipe was fully described in the 1955 report of the Division. There are now in operation 11 experimental trickling filters. Of these eight are arranged in four pairs, each pair being operated in exactly the same way as far as possible. Frequent analyses over a period of one and one-half years indicate that it is possible to operate such filters so as to obtain results which are statistically alike, and thus to indicate that results reported from the operation of a single filter have a reasonable degree of reliability. The group of filters have also contributed further data confirming our results on the effect of B.O.D. loading.

*Industrial Wastes*

In the past seven years in addition to the examination of over 1,000 samples of industrial wastes in connection with stream pollution, the Station has investigated wastes from 27 types of industries located in 35 cities and towns. In every case more or less research work was necessary; in many cases field assistance was given and in several, extensive investigations, generally including operation of biological units, oftentimes with chemical or other pretreatment methods were conducted. In many cases the wastes were of types formerly considered difficult or indeed impossible to treat biologically because of their toxicity or other inhibitory characteristics.

For over 60 years this Station has been interested in the treatment of wastes from the textile industry. Although a great many of the larger woolen plants have left Massachusetts, there are still large quantities of textile wastes discharged in many parts of the State; and because of changes in processing and especially because of the growing use of man-made fibers there are still many problems in the disposal of textile wastes. The most important waste formerly was that from the scouring of wool and this is still a serious problem, although the amount of wool now scoured in all of Massachusetts is probably less than that once processed in greater Lawrence alone. This waste is particularly important because of its heavy concentration of alkalinity, grease and B.O.D., of which each 100 pounds of wool scoured may contribute as much as nine pounds.

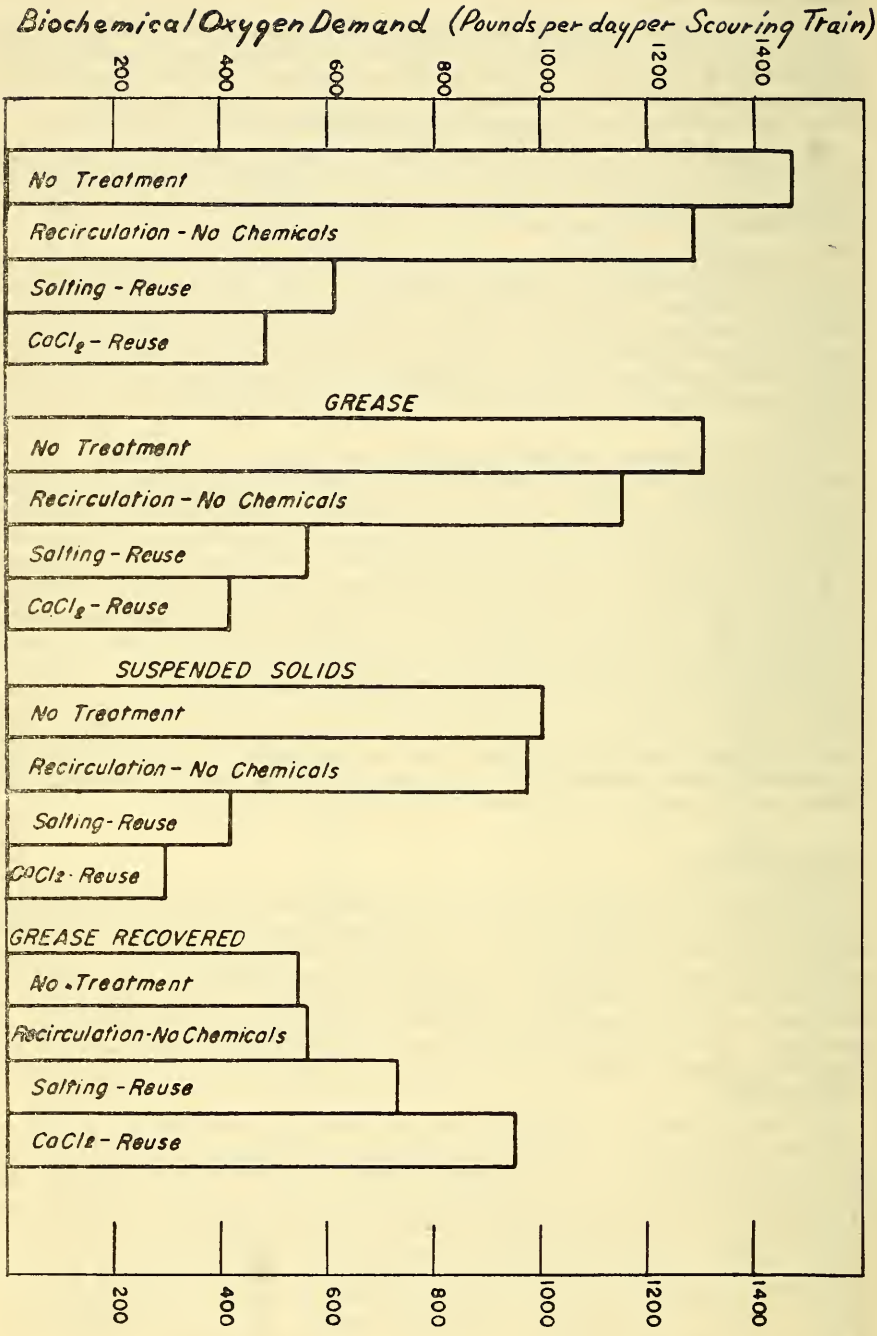


FIGURE 9
Effect of Calcium Chloride Treatment of Wool Scouring Wastes

In 1947, a process was developed at the Station which used carbon dioxide to reduce the alkalinity of the wool scourings and calcium chloride to break the fatty emulsions. Very satisfactory reductions of waste constituents were obtained in the laboratory and also in several scouring plants which adopted the process (Figure 9). Meanwhile further work at the Station showed that, when the calcium chloride was added to the wastes at temperatures near the boiling point, the reaction was accelerated so that classification of the wastes was complete in five to ten minutes instead of two hours in the first of the work process, but the resulting sludge was compact and could be quite readily processed for the recovery of grease and 80 per cent of the B.O.D. of the original wastes could be removed. It was also found possible to use with a fair degree of success common salt in place of calcium chloride at the higher temperature. One of the local mills adopted this process and found that the clarified liquor could be returned to the scouring bowls at a very considerable saving in chemicals. With this recycling process it was found that the net discharge of B.O.D. and of grease decreased over 60 per cent and the reduction in suspended solids was over 80 per cent from the figures before the process was in use. It was also found that the recovery of usable grease increased almost 100 per cent.

Changes in dyeing, particularly those involving the use of high pressures in the process, also made material differences in both the character and concentration of dyeing wastes. Extensive studies at the Station resulted in a satisfactory evaluation of the new wastes, and extensive experiments showed that with proper adjustment of pH and additions of nitrogen and phosphorus very satisfactory treatment could be accomplished on biological units. Another new development in dyeing resulted from the use of copper as a mordant in the dyeing of artificial fibers. Investigation showed that sufficient amounts of copper were discharged so that the wastes when carried to a municipal treatment plant could cause considerable interference in sludge digestion. The Station has cooperated with the Lowell Technological Institute on these and other problems regarding textile wastes.

Other extensive investigations were concerned with the manufacture of artificial fibers. It was found that in almost every case such wastes were bactericidal in nature and normally would not have been regarded as amenable to biological treatment. In several series of experiments, which included the use of the Warburg apparatus and extensive use of shaking equipment and particularly of a good deal of patience, it was found possible to develop bacterial flora either in trickling filters or aeration equipment which gave very satisfactory reductions in B.O.D.

Another waste in which extensive studies were made was that of processing flax in the manufacture of cigarette papers. With the cooperation of one of the industries engaged in this manufacture the waste was studied for almost a year. The character of the inhibiting substances was examined and found to consist of reducing sugars and various sulphur compounds, and nevertheless by the development of several cultures it was found possible to treat these wastes biologically. A series of three reports on this subject was prepared by the Department.

Work of quite a similar nature included investigation of polymerizing wastes, and other intermediates from the manufacture of plastics and wastes containing phenols and cresols. These latter substances are particularly important because in concentrations of only a few parts per billion they impart a very undesirable taste to water. All of these wastes likewise were found to be amenable to biological treatment.

Another chemical waste upon which the Station has worked periodically for many years includes formaldehyde and methyl alcohol among the inhibiting substances. The industry producing this waste has built a large treatment plant with the cooperation of the Station in its original design and maintenance and it is interesting to note that formaldehyde in concentrations up to 1200 parts, or that found in material advertised as disinfectant, has been satisfactorily reduced by biological means to five to ten parts per million.

Other inhibiting wastes, including those containing prussic acid and its derivatives from plating, high acid and high iron wastes from steel manufacture and rouge

wastes from the manufacture and processing of glass were shown to be satisfactorily treated by the same calcium chloride process which had been used for the wool scouring wastes.

Organic wastes which were subjected to experimental research included those from the manufacture and processing of fish meal, waste from the manufacture of gelatin and ice cream, several wastes from the meat packing industry, wastes from the cranberry industry on the Cape, wastes very high in fiber content from a fulling mill and a continuation of the work on laundry wastes. Two of the most unusual wastes were those from processing of sea moss and the manufacture of pickles and other condiments.

*Training Activities*

Practically all the colleges nearby regularly send one or more classes each year to visit the Station, and often members of these groups make individual visits later. Several hospitals also include visits to the Station as part of their training programs, and school children, Scout groups, and other youth organizations now make annual visits.

As previously indicated, representatives of many of the water and sewage treatment plants have spent more or less time at the Station for training, and this practice is growing. In addition, the orientation and indoctrination courses of the Department always include some time at the Station.

Since the new building was put into use, there have been several formal courses, lasting three or four days, given on water bacteriology, the membrane filter, and limnology. In addition there have been 18 foreign students, brought to the United States by Federal agencies, who have spent from two weeks to six months in training at the Station.

*Radiological Studies*

Since 1951 instruments for the measurement of radioactive emanations have been in use at the Station. The first work was on measurement of the natural activity, or background, of the water supplies of the State, all of which have been examined once or several times since. A little later the same levels were found for many of the streams in the State, especially those used for water supply, or those covered by our pollution studies. Almost from the beginning measurements have also been made of all the precipitation; this has been frequently in cooperation with various Federal agencies. These measurements became important during the several series of experiments conducted by the Armed Forces. The results obtained here and elsewhere have served to establish the patterns of passage of atmospheric contamination.

From time to time new equipment has been received for measurement of air volumes and for more accurate and more differential determination of various types of emanations for use by Civil Defense authorities and by Federal agencies.

The Station made studies of the effect of normal water filtration processes on radioactive fallout, which have been published in connection with other studies at Harvard University under the auspices of the AEC. These indicated that, although considerable removal took place, normal filtration was by no means sufficient to remove dangerous concentrations.

In another series of experiments the Station cooperated with the AEC and Harvard University in the measurement of isotopes deposited in Cochichewick Brook in North Andover, and measured for several days thereafter. The results of this study have also been published by the AEC.

*Plumbing Laboratory*

To help in obtaining a better understanding of the public health problems which result from faulty plumbing, the Department provided space on three floors of the new Lawrence Experiment Station for a Plumbing Laboratory. Special facilities have been designed and installed for the three-fold purpose of training, testing

and research. Classes have been held for plumbers, public health workers and others to explain and demonstrate the public health hazards in plumbing systems.

Special facilities of the laboratory include double check valve assemblies to show how potable water supplies must be protected against pollution when an auxiliary water supply is used in the same building; a thirty-five foot hydraulic leg of clear plastic pipe extending from the basement to the ceiling of the second floor shows how high water can be siphoned in a plumbing system and the danger that may exist from back-siphonage of water from plumbing fixtures; a hot water tank and heater is used to show water circulation, stratification, temperature and pressure build up; emphasis is placed on the danger from explosion if hot water systems are not properly installed and equipped with necessary safety devices; a high rate vacuum pump with tank and accessories will make it possible to carry on special demonstrations, tests and research over a range of controlled vacuum and pressure conditions; there are classroom facilities for 25 students.

The program of training is aimed particularly at helping the apprentice plumber have a better understanding of his importance and responsibilities in protecting the public health. It includes a course or series of lectures and demonstrations on the basic principles of hydraulics and public health for plumbers, plumbing inspectors, sanitary engineers and others. The training has been and will be developed with assistance of representatives of the plumbing trade, trade schools and the apprentice training program.

## Additional Information

Additional information is contained in Appendices A through J, which will be furnished by the Division of Sanitary Engineering on request.

Appendix A: Acquisition of Land for Protection of Water Supplies.

Appendix B: Average Daily Consumption of Water in Various Cities and Towns, 1950–1955, inclusive.

Appendix C: Summary of Water Treatment Plants.

Appendix D: Analyses of the Water of Public Water Supplies, for 1955: Surface Water Sources.

Appendix E: Analyses of the Water of Public Water Supplies for 1955: Ground Water Sources.

Appendix F: Status of Fluoridation of Water Supplies.

Appendix G: Summary of Work Done in Institutions.

Appendix H: Legislative Reports.

Appendix I: Cities and Towns in Which Rules and Regulations Are Effective.

Appendix J: Sewage Treatment Plant Data.

## DIVISION OF FOOD AND DRUGS

Section 5, Chapter 111 of the General Laws states in part, as it pertains to food and drugs, that the Department of Public Health shall take cognizance of the interests of health and life among the citizens of the Commonwealth concerning conditions and circumstances relative to the sale of drugs and food and adulteration thereof. The law then proceeds to set forth, in Chapter 94, many definitions and conditions affecting the sale of food and drugs. The Department has placed the responsibility for the enforcement of Chapter 94 and related sections as the duty of the Division of Food and Drugs.

The Division has carried on certain routine operations, as usual. However, in writing this combined annual report, the author would be remiss in not stating the pressing need for more personnel and funds to enforce the laws which place upon the Division, on behalf of the Department, considerable urgent responsibilities.

In order that one may properly evaluate the tremendous responsibilities generated by the food section of the industrial revolution which has come about following World War II, one has merely to reflect upon the billions of dollars' worth of chemicals now being sold to the food industry for incorporation into foodstuffs. In some cases incorporation of chemicals is, in the opinion of this Division, in the interest of the consumer; but in most cases it is not. Chemical industries expend many millions of dollars in retaining high-priced experts to carry on their technological advances to develop new ways and means wherein their chemicals can be incorporated into the greatest business of all — the food business. To cope with these experts, the Commonwealth's Division of Food and Drugs operates in old, outmoded laboratories, with insufficient personnel to deal with even routine problems, let alone complicated research programs.

Considerable time has been spent by the Director, working with Governor Herter's Labor and Management Committee, studying all aspects of the fishing industry and related activities of the present Fish Inspection Program of the Commonwealth. Legislation which would transfer the present fish inspectors from the Department of Natural Resources to the Department of Public Health was discussed by the Committee. Also discussed was the recommendation that a research program be carried on for one year by qualified food technologists, working under the supervision of a highly qualified research consultant. This research team would attempt to set up rapid tests for the grading of fish; investigate establishments used for the preparing, cooking, freezing and distribution of fish; investigate the facilities available on fishing boats; and make recommendations for improvement of the quality of fish brought into our port. The program would be financed by the industry through a licensing program in which industry would participate.

A gradual change in divisional policy toward violators of the laws and regulations entrusted to this Division for enforcement has evolved during the past six years through closer cooperation with local health departments and an expansion in inspectional and administrative services, to include not only an enforcement program but also an educational program. Although this program has imposed an additional burden upon the personnel of this Division, the results have been highly gratifying. Much of the overlapping of State and local services has been eliminated, and closer cooperation with the regulated industries has resulted. Local health agents, inspectors and sanitarians have allowed us to coordinate their efforts to such a degree that hardly a day passes that several of them do not see fit to call the Division's offices for advice and assistance. The response of industry to the educational program has resulted in the expenditure of hundreds of thousands of dollars in the renovation of obsolete establishments, or in the erection of new plants when renovation was inadvisable.

One of the major problems of this Division has been to see that the requirements of the laws as they pertain to food have been conformed to. Since the industries have realized that we are all working toward a common goal, that is, to see that the consumer receives a safe, clean and nutritious article of food, and that those who are ill receive full potency and standard drugs, a great stride has been taken to reach this common goal. The Division's perspective being to forward the public

health and the welfare of the purchasing public, and the industry's perspective to produce better consumer-acceptance of their products, both stand on an equal footing, with the consumer benefiting from the joint action. Under this progressive policy, whenever a violation is discovered by the Division a hearing is held in one of our office violators in the eastern part of the Commonwealth being serviced from the Boston office, and those in the western part of the Commonwealth from our Westfield office, so that a minimum of inconvenience in attending these hearings is experienced by the violator. If it is the first violation, and upon investigation evidence indicates a lack of understanding either of food technology processes or of the requirements of the laws, the violator is shown the error of his ways and is warned that any recurrence of the violation will be considered as willful and that more severe action will be taken.

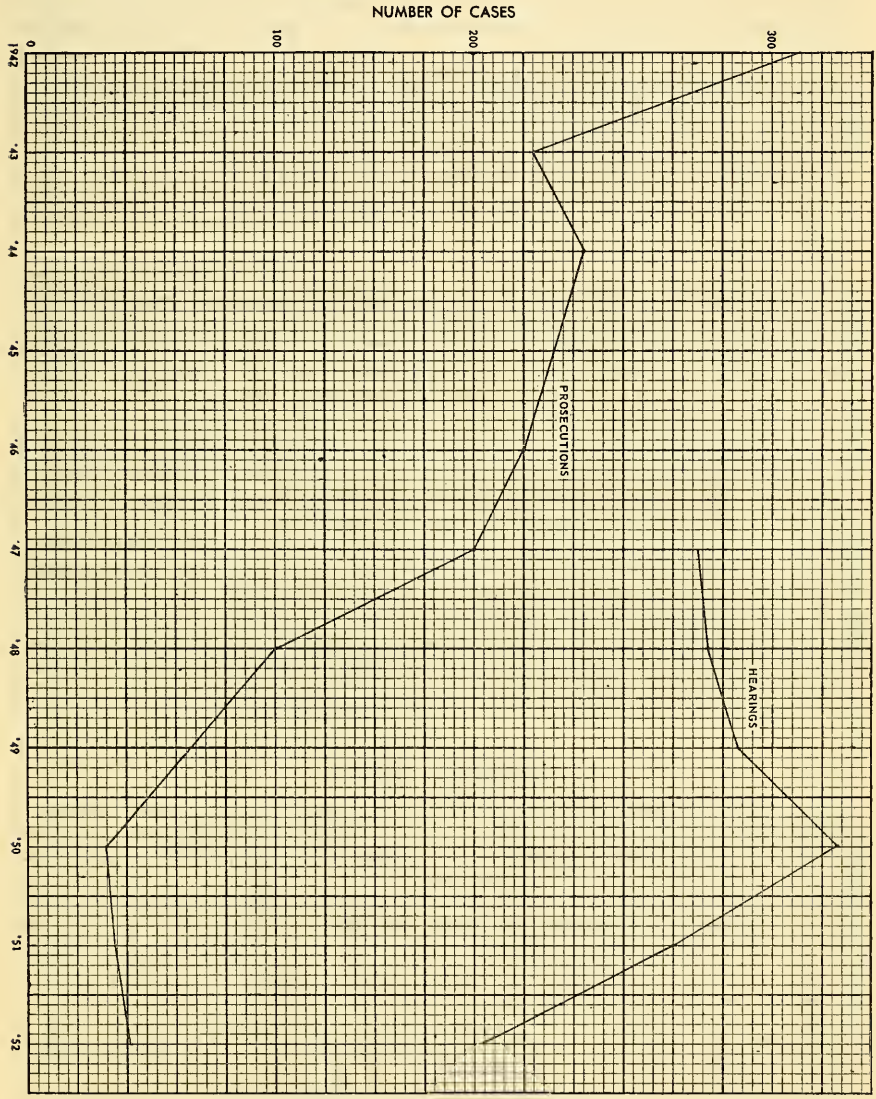


FIGURE 1
Prosecutions and Hearings, 1942–1952

Prosecutions in 1947–48 totaled 106; in 1949–50 there was a precipitous drop to only 31 prosecutions (Figure 1). A leveling off at 33 prosecutions in 1950–51 indicated a large drop in the number of prosecutions entered by the Division in the courts in comparison with a sharp increase in the number of hearings given, from 62 in 1946 to 319 in 1949–50. Since the adoption of our more progressive policy in the handling of violations, the number of prosecutions, having leveled off, is now about parallel with the drop in the number of hearings necessary. The Division feels that the number of violators is being steadily reduced by correcting those who were formerly flagrant violators and who may have been prosecuted several times with no improvement in their actual plant facilities. An increase in the number of prosecutions, to 41 in 1951–52, resulted from the extensive work done by the Division on horse meat and sulphite violations, particularly in those instances where there was a malicious intent and wilful violation of the law. Reinspections of establishments that had been renovated and modernized at our suggestion have shown that they have been eliminated from the list of constant offenders.

We hope in the continuation of our program to strive toward a goal which will eliminate obsolete and unsanitary plants from this Commonwealth so that the principles of modern sanitation can be applied to the establishments designed for their application. Of course there will always remain a certain number of malicious and wilful offenders, who must be prosecuted to the fullest extent of the law. These, however, represent a very small minority, and continued pressure will be brought to bear until they conform with the law. The Division is gradually whittling down the size of this group.

More modern food plant construction has resulted from the Division's attempt to prove to the food industry that good sanitary practice is an inherent part of good business. One large food manufacturer has gone so far as to construct a new quarter-million dollar establishment when shown by hard facts that good sanitation is good business. One large food chain spent almost one hundred thousand dollars in renovating bakeries and improving food-handling equipment.

Most of our meat markets are using temperatures close to 32 degrees Fahrenheit for their refrigerated cases instead of the previously used standard of 40 degrees, due to an intensive campaign by the Division toward this goal. The selling point of the program was the fact that meat products keep better and longer at the lower temperature. Most of our storekeepers have instituted bi-weekly deliveries of sausage meat, which was one of the items most involved in violations pertaining to decomposed meat. Here again, the storekeeper was shown that it was not only to his customers' advantage but also to his advantage to initiate such a system for purchasing sausage products. In many cases, an increase in sausage sales has resulted from this practice. During the hearings held on sausage meat violations, it was pointed out to the storekeepers that sausage meat is the most perishable meat commodity they handle and that even low temperatures of storage are not always efficacious in maintaining the purity and freshness of this product.

## Emergency Duties

The Division's action as an "emergency unit" was put to severe test during the natural disasters created by Hurricanes Carol and Edna in 1954, and the floods resulting from Hurricane Diane in 1955. During the early part of September, 1954, emergencies caused by the hurricanes opened up a new phase of operation by the Division; that is, the prevention of spoilage of large quantities of food, due to power failure. Utilizing its technical knowledge, the Division's personnel, under orders from the Governor's office, after the recommendation of Dr. Kirkwood, ordered seizure of the dry ice stocks in the Commonwealth. A program of distribution of this dry ice was set up, which saved many millions of pounds of perishable food from spoilage. The potential of the Division as an agency prepared and organized to handle emergency situations was vividly demonstrated. Not only was the spoilage of many millions of pounds of food prevented but also there were removed from consumer channels large quantities of spoiled or damaged foods. The Division coordinated and facilitated the cleaning up of contaminated restaurants and food-handling establishments so that the transmission of disease through the sale of

contaminated food was prevented. Spoiled meats and other foods were immediately transferred to dumps in order that putrefaction could not become a public health hazard. Immediate sterilization of the facilities of food-handling establishments prevented their impregnation with contamination, and subsequent public health dangers were thereby averted. Here, our lack of radio communication was pointedly brought out, with telephone and other means of communication unavailable, due to power losses.

The emergency work connected with Hurricanes Carol and Edna, which also included the salvaging or segregation of damaged food and drug products totaling many millions of pounds, kept the Division fully occupied for almost two months. Our already skeletonized program of food and drug supervision was further hampered. This, of course, could not be avoided, due to the pressing demands of the emergency work. Millions of dollars' worth of food which had become contaminated as the result of the disasters were seized and destroyed by the Division's inspectors.

Mopping-up operations were just about completed in October and we then had the task of destroying large quantities of liquor stocks, in conjunction with agents of the Alcohol Tax Unit of the Federal Government, said liquor having been contaminated by flood waters. The total value of the food and liquor destroyed by the Division as the result of contamination was approximately $10,000,000.

## New Developments in the Food Industry

### *Frozen and Pre-Cooked Foods*

One of the most radical changes in the presentation of foods to the consuming public, by a highly competitive food distribution system, is the increasing use of frozen foods and the advent of frozen pre-cooked foods. Catering to the ever expanding philosophy of merchandising, that anything that will make the housewife's task easier is a good business venture, hundreds of frozen food processing plants have sprung up in Massachusetts. Such items as frozen pre-cooked fish sticks, pizzas, chicken dinners, etc. have become commonplace. This is a very serious public health problem, since many persons have the concept that all one has to do in the preparing of a frozen food is to process it, put it in a home freezer, and sell it as a frozen food product. This, of course, is far removed from the truth. Raw materials going into frozen foods must be of excellent quality before processing. Great skill is needed in the sanitary preparation of these products, and quick-freezing equipment is mandatory in order to maintain quality, wholesomeness and nutritive value. The Division in its token supervision of this mushrooming enterprise has found extremely high coliform counts, filth and contamination as well as decomposition in many of these products. This is not limited to small producers. Contamination has been found in the products of large producers, who should have been able to prevent such contamination in view of the large technical staffs they employ to cope with these problems.

Preliminary investigations by the Division have indicated a large field of public health interest and research in the deterioration of frozen foods from a nutritional point of view. Unstable vitamins and other components are destroyed by improper handling, shipping and keeping of these foods in their transmission between manufacturer and consumer. Besides being a definite public health problem, in that the ingestion of foods which have lost certain nutritive factors in part negates the value thereof, there is the problem of violation of the adulteration laws since they contain less than the professed standard therefor. Cold storage holdings, which previously had been the overflow of seasonal purchasing procedures, have been swelled by this far-reaching phase of the food industry.

## Slaughtering

### *Slaughterhouses*

Since the adoption of the Massachusetts laws pertaining to slaughtering, many changes in the sanitary concepts of slaughtering have developed. Although our laws and regulations have kept up with these developments, the physical establish-

ments of our State-inspected slaughterhouses have not. As in all matters, a point is finally reached wherein good public health practice cannot tolerate the maintenance of decrepit and obsolete construction not conducive to proper sanitation.

A program has been initiated to improve the conditions in this type of establishment, which conditions have now become greatly intensified, due to the closing of the slaughterhouses connected with the Brighton abattoir. Our program has been hampered by the illness of one of our veterinary food inspectors.

*Poultry Slaughtering*

On a par with the expansion in the frozen food industry has been expansion in the poultry slaughtering industry in Massachusetts. During the last decade, poultry consumption in this Commonwealth has increased in the various categories on the average of tenfold. Innovations in the marketing of poultry in the cut-up form have provided an outlet for segments of diseased, deformed poultry. Certain unscrupulous processors will dissect a carcass, remove tumorous growths, emaciated members, diseased portions and the like and place in consumer channels those portions of the carcass which outwardly appear wholesome. Here again, the Division has not been able to extend adequate protection to the consumer from this type of operation due to our lack of personnel. Seizures of poultry made by the Division have been of such serious consequence that upon presentation of evidence to lower court judges, the cases were directed to the Grand Jury for indictment and action.

Poultry products have been involved in a majority of the food poisoning cases investigated by the Division. This situation exists not only in Massachusetts but poses a problem for the entire country and has caused to be introduced before the Congress of the Uuited States legislation for Federal inspection of poultry. This, however, will not solve the problem of inspection of the product within the confines of our Commonwealth. A more progressive and comprehensive program of poultry inspection is absolutely mandatory in the interest of the public health and welfare of the consumer.

## Registration of Food Processors

Although Massachusetts has long been a forerunner in progressive public health legislation pertaining to food and drugs, one of the most glaring weaknesses of the enforcement structure has been the lack of a general licensing program for food processors. Prior to the passage of legislation requiring that all food processors be registered, which became effective in 1956, any person who wished to process food in a business other than the several specific food businesses already licensed would set up certain processes, canning or freezing food without health authorities being cognizant of his operations. The initial attempt by the Department to license food processors met with severe opposition and we had to be content with a registration program. It will require some time to develop this program of registration, but it is hoped that with the cooperation of the local boards of health great benefit will result in the interest of the consuming public.

## Drug Abuses

*Harmful Drugs*

Chapter 577 of the Acts of 1954 defines "harmful drugs" as those upon the label of which the Federal law requires the statement, "Caution. Federal law prohibits dispensing without prescription." In 1955, this definition was amended to specifically include any derivative, active principle, preparation, compound or mixture of barbituric acid, amphetamine, ergot, or any hypnotic or somnifacient drug.

Investigations by the Division have revealed that abuse of this category of drugs far surpasses the abuse of narcotic drugs. Although the regulated use of these drugs has proven to be one of the biggest boons to an ailing mankind, disastrous consequences have resulted from their abuse. Since this is a summary report, the reader is referred to a number of publications issued by the Department in detail on the findings of our investigations. Two reprehensible facets in the improper use of these drugs stand out:

First, the fact that certain members of the medical profession have been prescribing harmful drugs, such as barbiturates and amphetamines, in large quantity.

Second, that the barbiturates and amphetamines have entered the channels of narcotic drug traffic via the underworld.

In the evolvement of our present high-tension way of life, nervous disorders and mental illnesses have taken a sharp upward trend. In order to meet the demand by the medical profession for more effective medication to cope with this problem, the chemical and drug industries have developed new and more potent sedative, hypnotic, and somnifacient drugs. The introduction of these drugs has been paralleled by the introduction of new stimulant drugs represented by the amphetamine family.

With the advent of the somnifacient and stimulant drugs, abuses became evident. After World War II, public health authorities and other control officials became increasingly alarmed over these abuses. In 1948, the Massachusetts Department of Public Health introduced a bill into the State Legislature which became the Commonwealth's first harmful-drug law. Personnel, however, were not provided for its enforcement. Inspectors had to be taken from already inadequately staffed inspection programs and assigned to inspect specific complaints of abuses of the harmful drugs. The first important investigation, conducted in cooperation with the Division of Hospital Licensing, disclosed a glaring inadequacy of the law. It restricted the retail sale of harmful drugs at drugstores but did not affect their distribution at wholesale.

An inspector found 20,000 doses of barbiturates between blankets in a linen closet at a nursing home. These had been obtained from a wholesale drug house. Such incidents, together with information obtained through the special commission study, made clear the need for revision of the harmful drug law.

*Harmful Drug Law Revamped*

In 1954, the law was revamped to prevent the recurrence of wholesale abuses of these drugs. Specific definitions for oral and written prescription were set forth for the first time in the history of law, and an inspector was assigned to enforce it. A Federal Food and Drug Administration inspector, a Board of Pharmacy inspector, and the Division cracked down on a large wholesaler-manufacturer of barbiturates and amphetamines. Millions of capsules and tablets were confiscated and destroyed, and the operator was prosecuted. A survey of the Massachusetts College of Pharmacy revealed that huge amounts of these drugs were being legitimately prescribed. An evaluation revealed that millions of pounds were being manufactured yearly in the United States. Common drugs were being compounded with harmful ones and were being marketed in myriad combinations. While control officials were trying to evaluate the extent of the problem, our inspector, making an investigation in cooperation with two Boston policemen, came upon the first indication that barbiturates and amphetamines were being peddled by an organized gang with a modus operandi similar to that of peddlers of narcotics. Two such gangs were apprehended and prosecuted.

Again, technicalities were found in the law behind which the violator could take refuge, but emergency action by our legislature resulted in a broadening of the definition of a harmful drug and made its illegal possession a crime. The barbiturates and amphetamines have a reaction of habituating prolonged users by a little understood process, which is not technically addiction but does cause dependence upon these drugs. Such a habitué will steal or commit any other crime to acquire them. Evidence has shown prostitution, juvenile delinquency, and crime stemming from the use of these drugs. In one case, a habitué forged several prescriptions for barbiturates, but when apprehended he managed to escape a penalty for the forgery because of a legal technicality. Again, the law was amended to make the forgery of a prescription for a harmful drug a crime.

*Law Enforcement*

Our State, a pioneer in public health legislation, initiated the Massachusetts Narcotic Law in 1885. This was an attempt to minimize the abuse of harmful

drugs, an age-old problem which has addicted and enslaved those who have succumbed to it, resulting in many disrupted lives and all types of crime, including murder. An analysis of the problem breaks it down to two parts: drugs which emanate from the so-called legitimate channels, that is, drugs manufactured under Federal supervision and sold through legitimate drug outlets; and drugs which originate from illegitimate sources, that is, through smuggling and similar operations. For the most part, the drugs legitimately procured are used under proper direction of a physician or dentist. A small part of these drugs falls into the hands of abusers, through thefts or falsification of symptoms to physicians. Recent investigations by the Division disclosed that several addicts had obtained narcotics to supply their needs from three different physicians, who, of course, were not aware of the duplicity. Our inspector also apprehended an addict with a suitcase full of various drugs, including a quantity of narcotic drugs, acquired through falsification and theft.

It is the responsibility of this Division, acting for the Department, and of police officials, to enforce the narcotic laws. By mandate of the Legislature, the Department is required to make analyses for various police agencies in connection with narcotic law enforcement as well as to enforce the law and take cognizance of any violation thereof. Due to our lack of personnel and the lack of coordination of police agencies in this problem, very little has been done in the enforcement of these laws outside of the Boston area.

In the Division's investigation of the harmful-drug law abuses, glaring violations of the narcotic laws have been observed. We initiated the policy of attempting to coordinate police efforts with ours for more stringent enforcement and have obtained fine cooperation. Worthy of special note are the Attorney General, the Boston police, the Massachusetts Police Chief's Association, the Department of Public Safety, and the District Attorney of Suffolk County. It is hoped that when the Division obtains sufficient personnel we shall be able to further carry on this work.

## Chemicals in Food

Prior to World War II, the Food and Drug Division encountered relatively few chemical additives to our vast food supply. Following World War II, our chemical industries found themselves with many millions of dollars' worth of surplus chemicals on hand and manufacturing facilities to produce thousands of tons of chemicals annually. In looking for an outlet for these products they found a ready market in the field of agricultural pesticides and insecticides. A genuine attempt was made to regulate the use of chemicals on raw agricultural products on the farm by the passage of the Miller amendment to the Federal Food and Drug Act. Since then, interpretations of the original law have broadened the base decidedly. Where the original intent was to allow for the addition of pesticides to crops in the field, the law has been used to allow for the introduction of preservatives in processed foods. This has posed a considerable problem for public health authorities since so little is known about the long-range effects these chemicals may have on the human organism, not only as each chemical is ingested individually, but in combination with the hundreds of other chemical additives. At the present time there are approximately 350 applications pending on these additives for action by the Federal Food and Drug Administration. Approximately the same number of applications are anticipated this year. In the opinion of the Director of the Division, this problem constitutes the number one health menace of our times. Every day brings about new evidences as to the fallacy that we are able to prove the safety of chemical additives to food.

Recently, in Massachusetts, one hundred young children were made ill when they ingested novelty popcorn products colored with "Orange One Certified Food Color." The Division brought this matter to the attention of the United States Food and Drug Administration, who, by exhaustive tests through the years, had certified this color as safe for use in food. It was later learned that the Administration had evidence in its possession that this particular coloring and several of its chemical brethren had carcinogenic properties. Three of these dyes have since been decerti-

fied and three are in the process of being decertified. Another common household chemical additive known as "coumarin," which is a synthetic vanilla, was also found to possess carcinogenic properties.

The case in point from the evidence on hand is that although there are many theories as to the methods of determining the safety of chemicals in food, no sure-fire, fool-proof method has been developed. Industry attempts to interpret the United States Food and Drug Administration's procedures under the Miller amendment as being an approval program. From our inquiries and our study of the matter, we find that this is not so. The United States Food and Drug Administration merely carries out its legal requirements under the amendment, judging, from facts presented by the private applicant, what would be considered a safe tolerance. This is based on the applicant's research work. Recently it was found that the addition of an organic phosphate to a food which contained another organic phosphate reduced the tolerance for both compounds manyfold. The Administration now requires cross checking of all four or five organic phosphates submitted. The question this Division raises is: Why shouldn't all of the chemical additives be cross checked; and who can say whether other chemical additives passing into the human system, besides the organic phosphates, may or may not catalize a much more toxic reaction, precipitating any one of a hundred organic failures? At best, the ingestion of normal natural foods poses difficulty for digestion and assimilation in many human beings.

Again, I reiterate that this is an extremely serious problem, and the most serious that faces this generation from a public health point of view. The Department, recognizing this, has passed a regulation forbidding the use of preservatives in food to be sold in this Commonwealth without the Department's approval. The addition of aureomycin and biphenyl to foods has been disapproved by the Department at this date. The use of ammonia and sodium orthophenylphenate to food has been approved. The approval of the orthophenylphenate compound has been on the basis that the food for which it has been approved be thoroughly washed so as to eliminate all but negligible traces of the compound.